- Industrial relations – where to?
- Steam control valves
- New products from pine gum
- Wetting agents for caustic extraction
- New results in alkaline pulping

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

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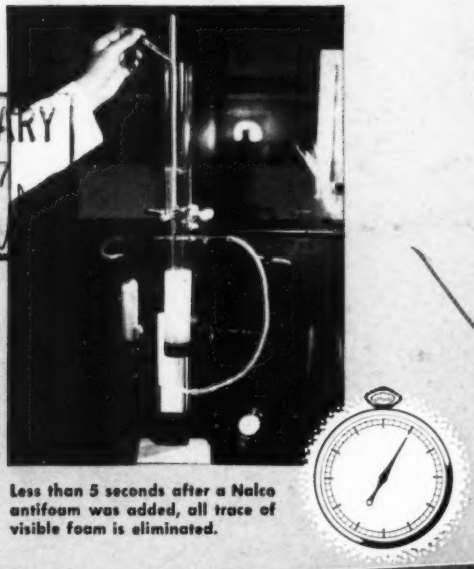

Watch the second hand as this foaming sample of paper mill stock gets the Nalco treatment.

Less than 5 seconds after a Nalco antifoam was added, all trace of visible foam is eliminated.

urthermore... Nalco GETS THE DROP ON FOAM YOU CANNOT SEE!

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32 West 66th Place, Chicago 38, Illinois
CANADA
Alchem Limited, Burlington, Ontario
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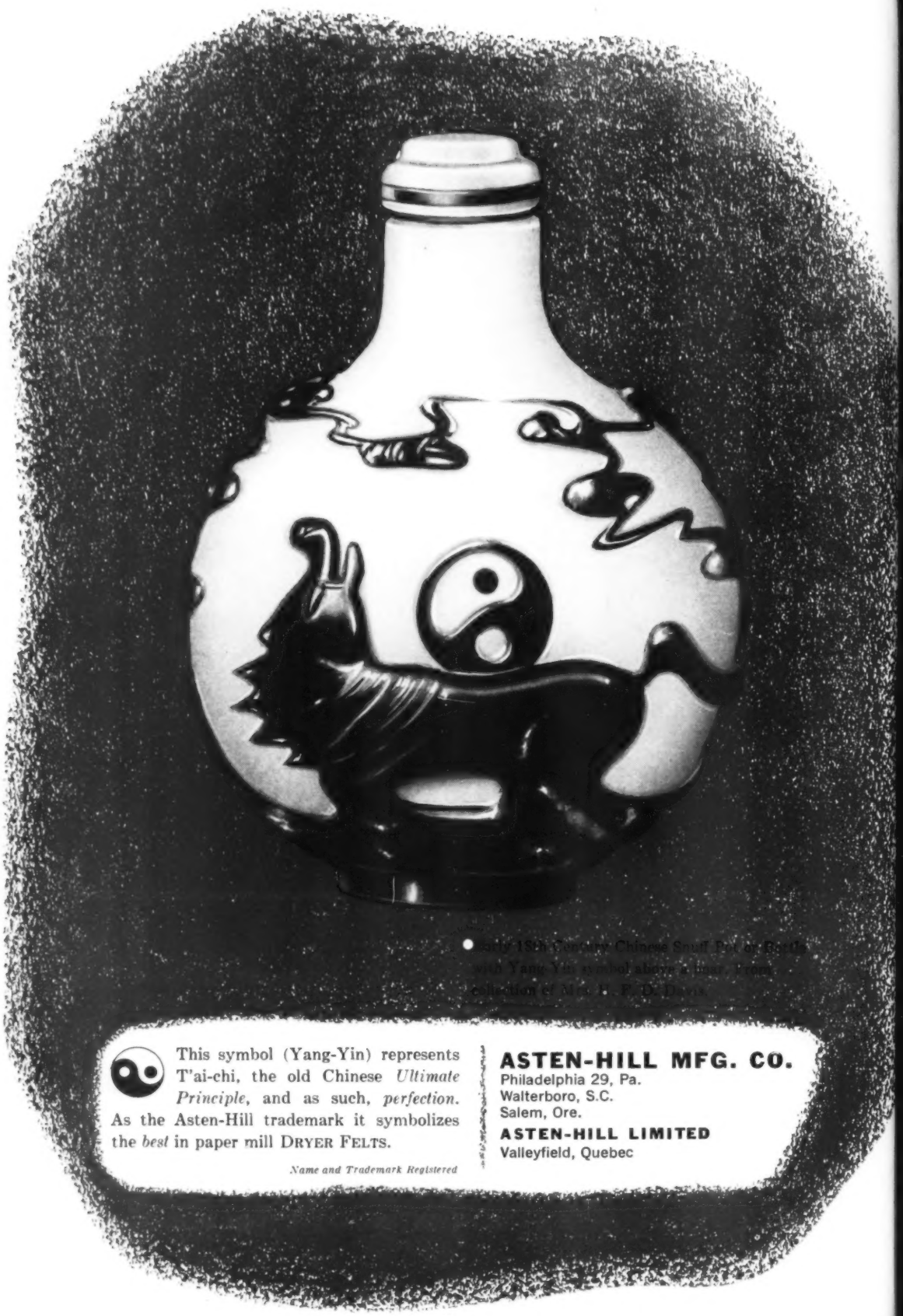
Flox Company, Inc., Minneapolis 3, Minn.
ALY: Nalco Italiana, S.p.A. SPAIN: *Nalco ponola, S.A.* WEST GERMANY: *Deutsche lco-Chemie GmbH.*

●The simple demonstration above leaves no doubt that Nalco chemicals quickly and effectively eliminate all visible foam.

But here are even more conclusive findings: (1) In a mill where there was *no visible sign* of foam, the application of a Nalco antifoam quickly produced a very substantial increase in screening efficiency . . . and overall production; (2) In another mill, Nalco chemicals solved the problem of an erratic Decker level where there seemingly was no foam. Here, too, production went up through increased Decker capacity.

Simplest explanation of Nalco effectiveness is the dual action—*antifoam* action to prevent bubbles from forming . . . *defoaming* action to combat existing foam! Your Nalco Representative has all the facts, or write direct.

HE Nalco® SYSTEM . Serving the Paper Industry through Practical Applied Science



• Early 19th Century Chinese Snuff Bottle with Yang-Yin symbol above a bear. From collection of Mrs. E. P. D. Davis.

This symbol (Yang-Yin) represents T'ai-chi, the old Chinese *Ultimate Principle*, and as such, *perfection*. As the Asten-Hill trademark it symbolizes the *best* in paper mill DRYER FELTS.

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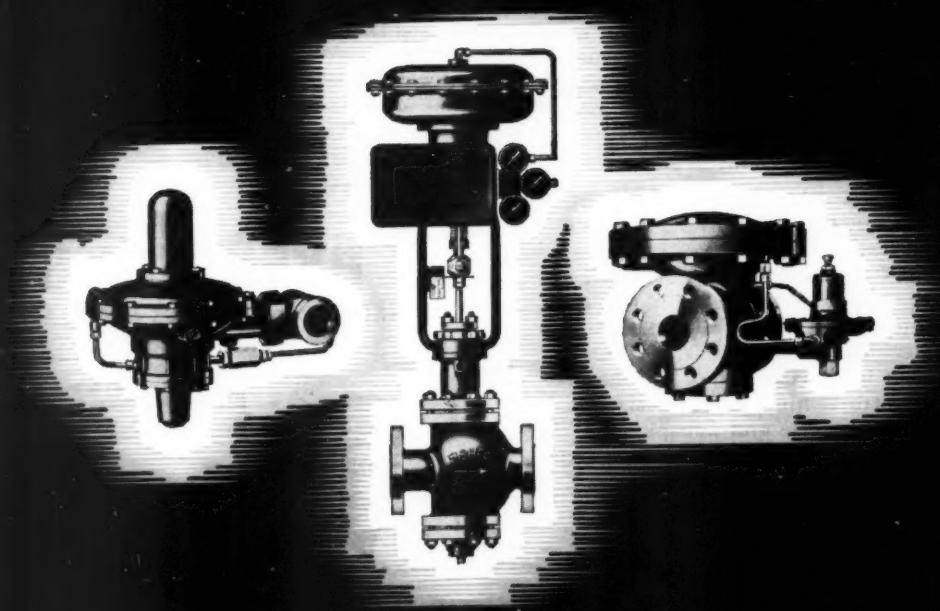

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Latest information on ending tough corrosion problems

Get this new booklet on PVC

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Here's the latest news about Ryertex-Omicron PVC—the remarkable plastic with a 20-year record of victory over highly corrosive solutions and gases. In this new edition of the PVC booklet, you'll get up-to-date facts and figures that can mean substantial savings in your installation and maintenance costs.

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In the PVC booklet, you'll find laboratory test data showing how PVC defeats a wide range of more than 280 corrosives—acids or alkalies, gases or liquids. You'll find how the special formula and fabrication techniques used in making PVC result in a material that is noncombustible, highly heat resistant, nonmagnetic and nonsparking—immune to weathering, rotting and "aging."

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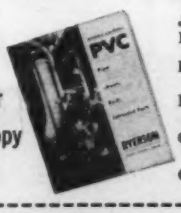

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 39 **NUMBER 9** **DECEMBER 1957**

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Fritz Publications and its staff extend their readers and advertisers A Merry Christmas and best wishes for a prosperous and Happy New Year

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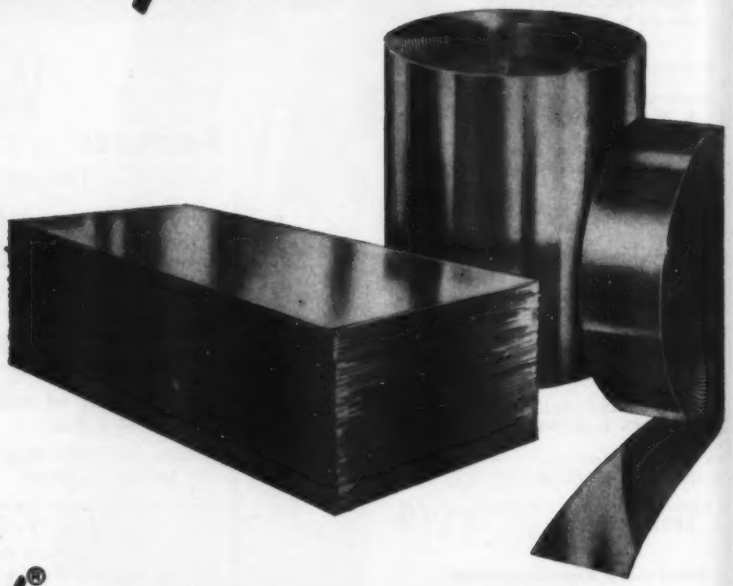

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The cost of packaging not a luxury item

The annual per capita cost of $88 that the American nation currently spends on packaging, and which involves among others the use of 18,000,000 tons of paper and paperboard, is not a luxury expenditure.

The package has a functional use of protecting and preserving its contents under all conditions of handling and storage. Subsequently, it is required to continue its job as a salesman in the supermarket and in the consumer's home.

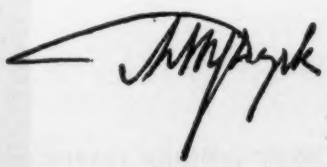
The package therefore is used to a large measure as a substitute for labor and human effort; and as such it saves the consumer an expenditure for labor—a commodity known as the most expensive one in the USA. Modern methods of packaging can be viewed as a necessary development similar to those of mass production, automation, mechanization, etc. Packaging is one of the basic factors that lead to the ever accelerating rates of productivity that have made this nation the world's greatest producer of goods, turning out approximately 50 per cent of the world's output in both produce and energy.

Essentially, therefore, modern packaging is one of the factors on which our mass production and our high standard of living are based. Its almost unbelievable rate of growth in the last 20 years has been in answer to demands made by our national economy, convenience, and the reduction of the costly human effort.

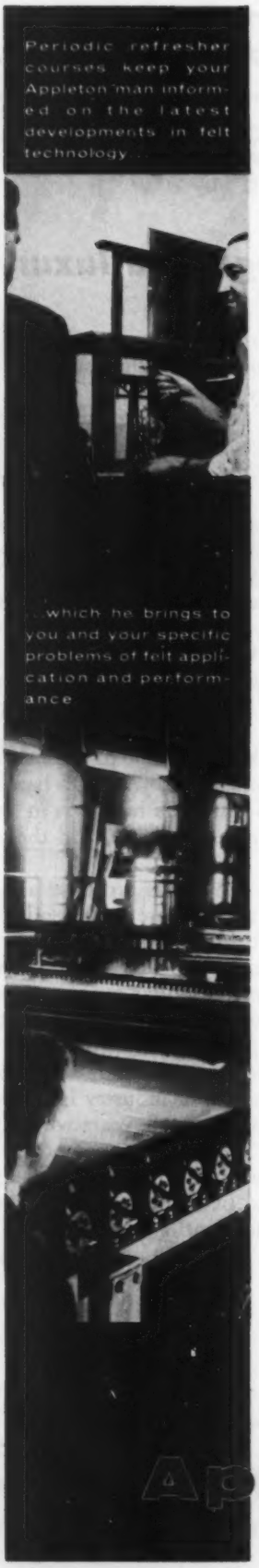
Statistics show that packaging since 1939 has grown at a rate five times that of our population growth, while the increase in expenditure for packaging between 1939 and 1954 has been over 340 per cent.

According to Herbert B. Woodman, president of Interchemical Corp., packaging today takes these portions of the dollar output of the following industries: metal foil—80 per cent; non-flat glass—70 per cent; paper and paperboard—55 per cent, and steel—9 per cent.

There is little doubt that packaging will continue to grow at an even more accelerated rate. The trend in the paper industry is toward increased coating of paperboard, especially in the next few years when the emphasis will be on increased product quality to meet growing competition. It is quite likely that in the relatively near future practically all paperboard produced will be coated, which will permit it to perform more fully the functional and decorative demands needed in modern packaging.



Felt making starts here ...with a superintendent, a paper machine, and the Appleton man.


Periodic refresher courses keep your Appleton man informed on the latest developments in felt technology
...which he brings to you and your specific problems of felt application and performance

No vacation, this, but the start of a 12-hour workday...par for the five-day course on felt design and manufacturing which your Appleton man takes each year.

And this is a picture of applied research. Your Appleton man is reviewing problems encountered in the field with our research and technical people. He is seeking—and getting—practical answers to your problems of felt application and performance.

All of which adds up to the fact that the time you spend with your Appleton man is time well spent. Appleton Woolen Mills—*working with the paper industry*—Appleton, Wisconsin.

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For superior performance...

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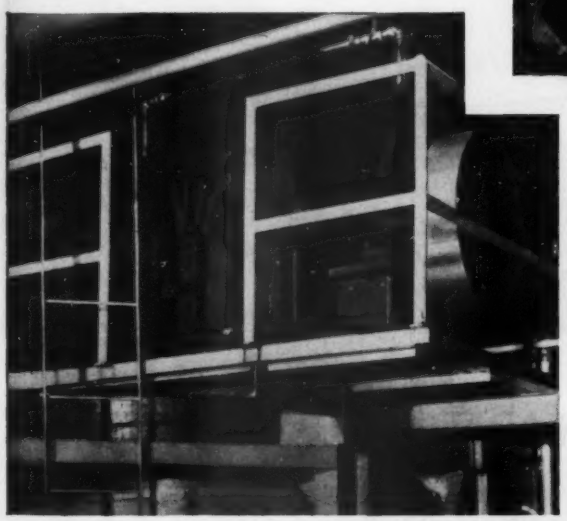
SHREDDERS AND WOOD HOGS

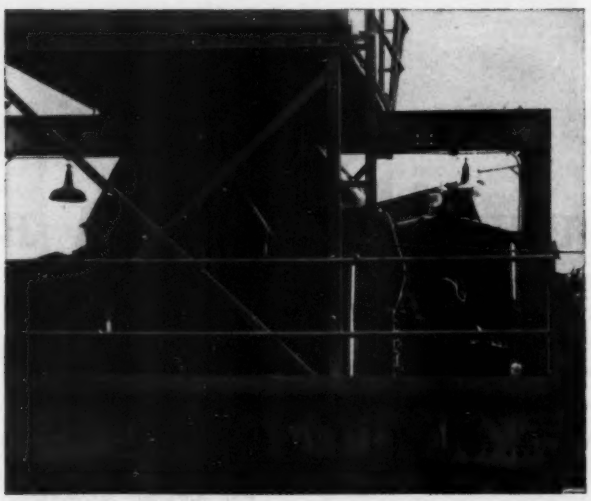
Jeffrey shredders play an important part in pulp and paper mills, speeding and standardizing production. A few of the uses are bark shredding, rechipping of oversize chips, semi-refining of partially cooked chips, crushing salt cake and pulp lap shredding.

Whatever your reduction problem, Jeffrey engineers can help you select equipment best able to solve it. They will also advise you on conveyors for moving materials to and from the job. The Jeffrey Manufacturing Company, Columbus 16, Ohio.

Oversize chips from the wood screen are shredded by this Type B shredder—a strong, rigid machine that's built for work requiring heavy impact and high capacity.



Shredder for reducing wet, dry or frozen pulp laps, paper board or Kraft sheets to a well disintegrated pulp. Its hook-shaped hammers effectively grip and tear the stock.



Two large wood hogs taking bark, broken pulpwood logs and other wood waste from barking drums, reducing it to a size which can be efficiently handled by a blower or conveyor.

JEFFREY

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For detailed information on this versatile, highly uniform line of corn starches, write to:

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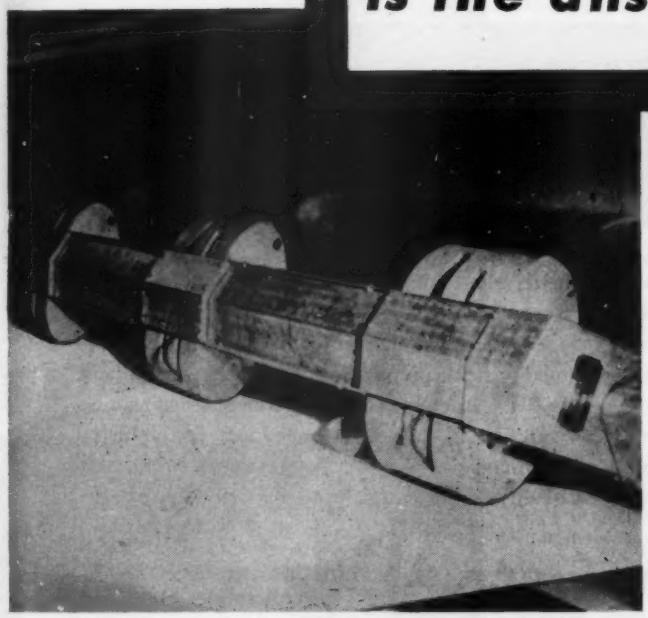
Makers of a complete line of starches for every use in the paper industry: TEN-O-FILM® AMIJEL® • EAGLE® • FOXHEAD® • GLOBE® • HERCULES • GLOBE® DEXTRINES • CORAGUM® • LAMODEX®

Want increased machine speed? Want more tonnage?

The new

HURLETRON Automatic MOISTURE CONTROL

is the answer!



Under manual operation, moisture varies so much that it is common practice to overdry the sheet to prevent exceeding customer specifications. The Hurletron Automatic Moisture Control makes it possible to operate with an average of 1% higher moisture content. Because control of moisture is entirely automatic, the peaks are reduced, steam consumption is decreased, and machine speed is increased. A major paper mill paid for the Hurletron Moisture Control in less than four months with the above savings. Find out how your mill can get more machine speed with no increase in production costs . . . ask about the Hurletron complete package today.

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Electric Eye Equipment Company

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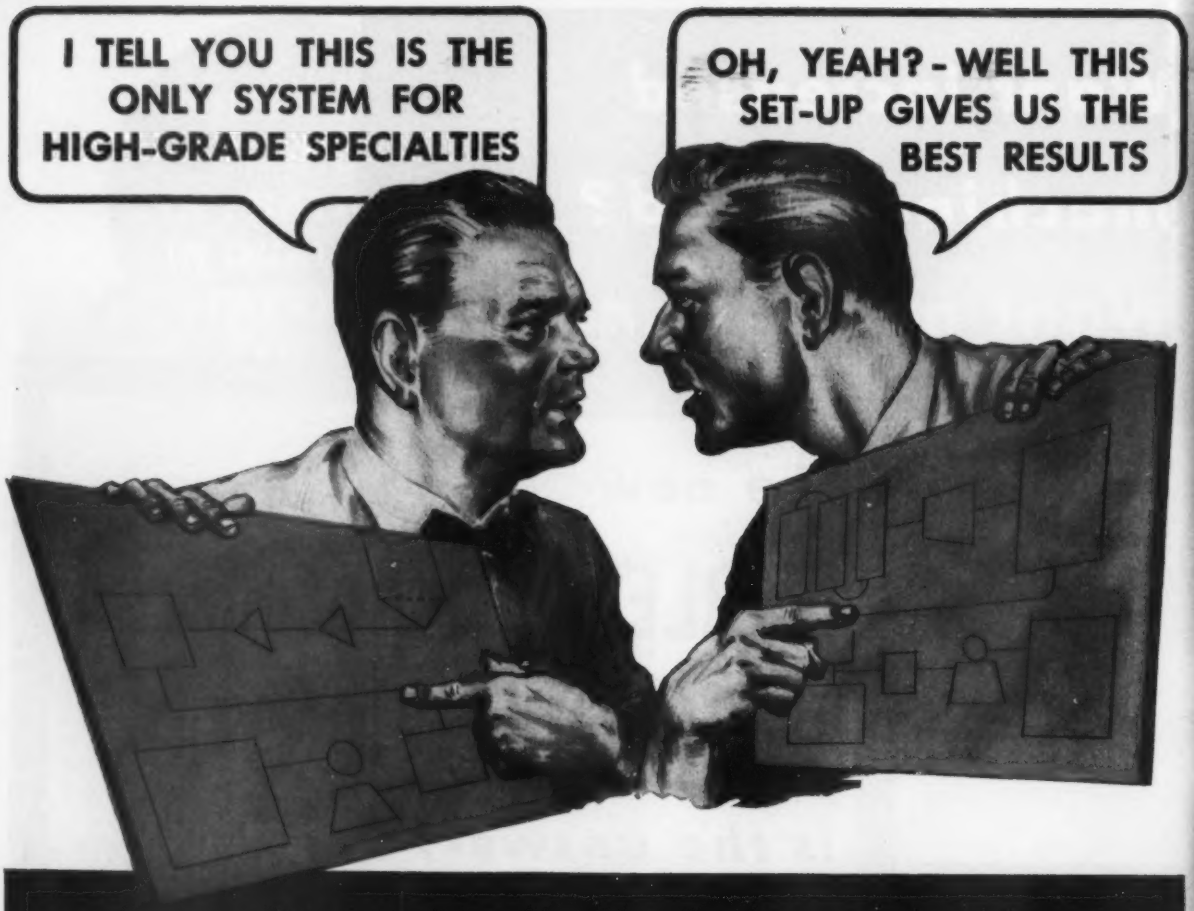

But there's one thing they agree on...

E.D. **Jones**

A flow-chart will get you an argument almost anywhere, any time, because different systems have their own partisans — even when the end product is the same. Maybe you wouldn't agree with either of these superintendents.

But on one point you'll find more and more agreement: whatever the system, Jones equipment belongs in it — for better performance, better sheet qualities and over-all operating efficiency and economy.

Only Jones offers a complete range of top-quality stock preparation machinery . . . pulpers, beaters, disc and conical refiners, screens. So you can always count on Jones for unbiased recommendations for any system — and top quality equipment to meet *your* requirements.

Ask your **Jones** *man first...*

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Pittsfield, Massachusetts

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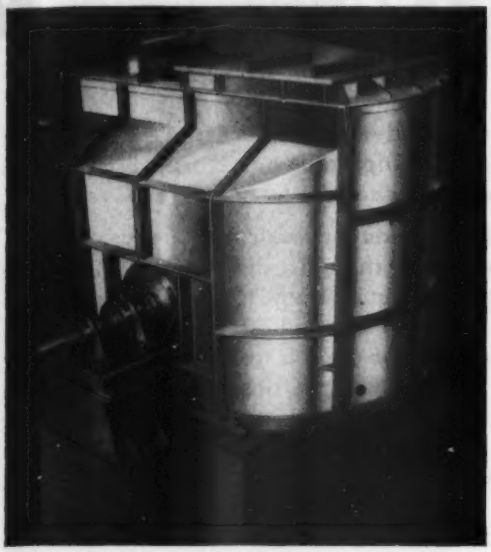
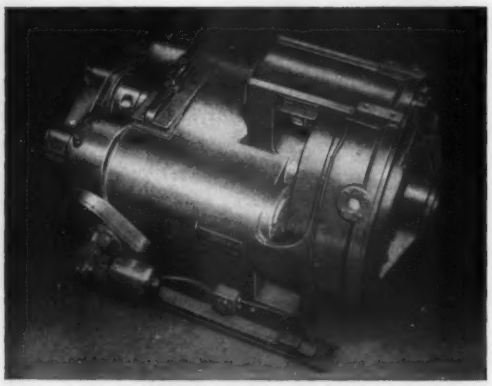
Jones HI-LO PULPER



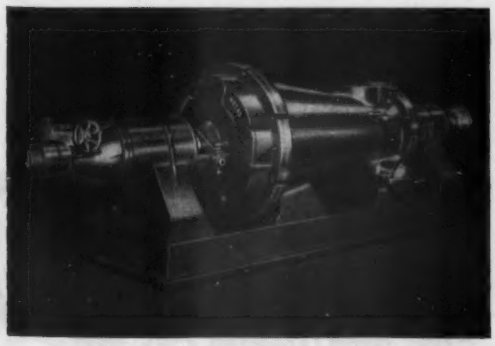
Engineered to eliminate the compromise imposed by conventional single-rotor pulpers between maximum circulation and complete defibering, the HI-LO employs two separately powered rotors to provide maximum pulping *and* complete defibering, with significant savings in time and power. For details, ask for Bulletin EDJ-1063.

Jones DOUBLE-D REFINER WITH DOUBLE EQUA-FLO EFFECT



The only unit of its kind with *two stages of refining* in one machine, the Jones Double-D can actually do twice the work of conventional refiners because it has double the refining area — 2200 square inches in the 42″ model; produces stock of equal or better quality at a considerable saving in operating cost. Ask for Bulletin EDJ-1083.

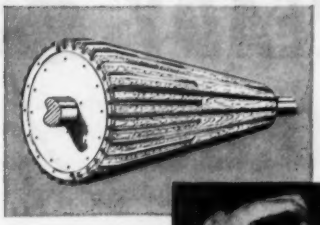
Jones ROYAL JORDAN

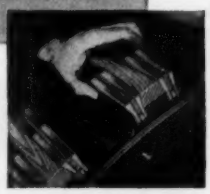


Like all Jones Jordans, the Royal incorporates exclusive Jones features developed in more than a century of service to paper mills. In addition, the Royal, a war-born unit developed originally to process nitrocellulose has some special features worth investigating. Ask your Jones representative or write for Bulletin EDJ-1007B.

TIME FOR REPLACEMENT?

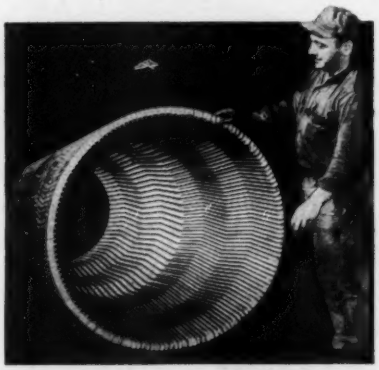
Jones® Adapta-Plug





Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

Jones® FULBAR SHELL FILLINGS



A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

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Northwest dependability is a direct result of Northwest design. Power is brought to the action by the most direct route. Machinery Bases and Machinery Side Frames are heat treated, cast steel to take the shocks of digging. Parts and assemblies are ruggedly built and heavy enough for the job to be done. The simple "Feather-Touch" Clutch Control brings ease of operation and is free from compressors, valves, tubing and other delicate mechanisms. The Helical Gear Drive, the Cushion Clutch, Uniform Pressure Swing Clutches not only play a part in better output but they combine in smooth, trouble-free operation to *assure performance when it is needed.* Your Northwest is *always ready to go!* There is no more valuable quality in Shovel or Crane equipment. You can buy it in a Northwest.

NORTHWEST ENGINEERING CO.
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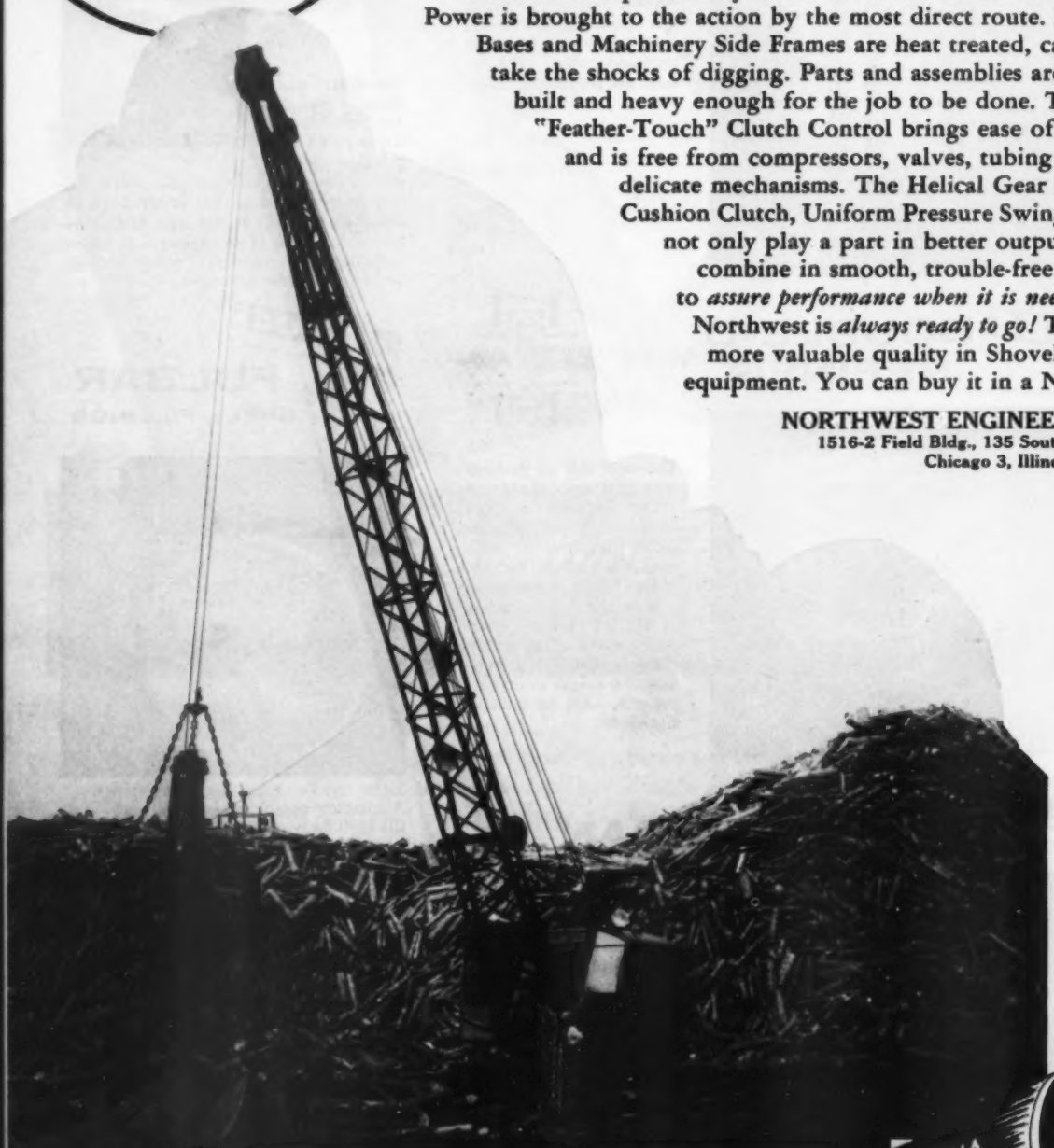

NORTHWEST

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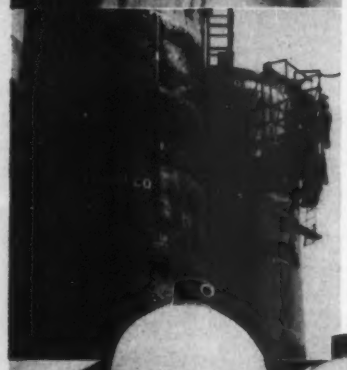

At Weyerhaeuser's new sulphite mill:

CB&I-built Digesters and Accumulators

are field erected and stress relieved

CB&I Field Services *went to work* at Weyerhaeuser's new 400-ton sulphite pulp mill—recently completed at Cosmopolis, Washington. The 7 CB&I digesters and 4 accumulators were stress relieved in the field. All welds were similarly checked by specially designed, non-destructive X-ray examination equipment.

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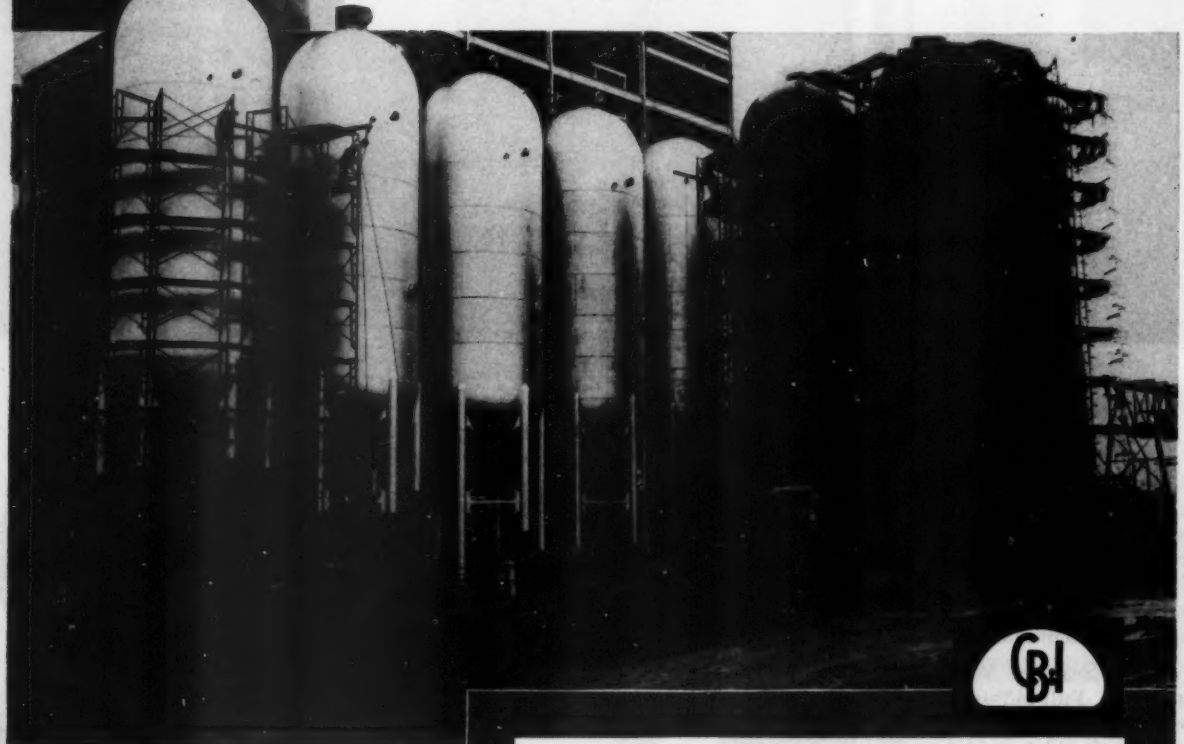
Left: Automatic (patented) girth welder being adjusted for welding circumferential joints on accumulator.



Left: 60-foot high digesters are 17 feet in diameter.

Right: Four accumulators have 1,290 cubic foot capacity each.

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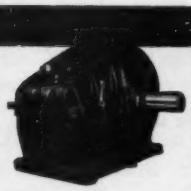

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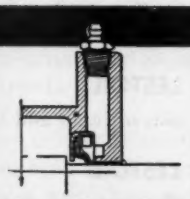

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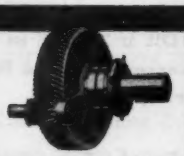

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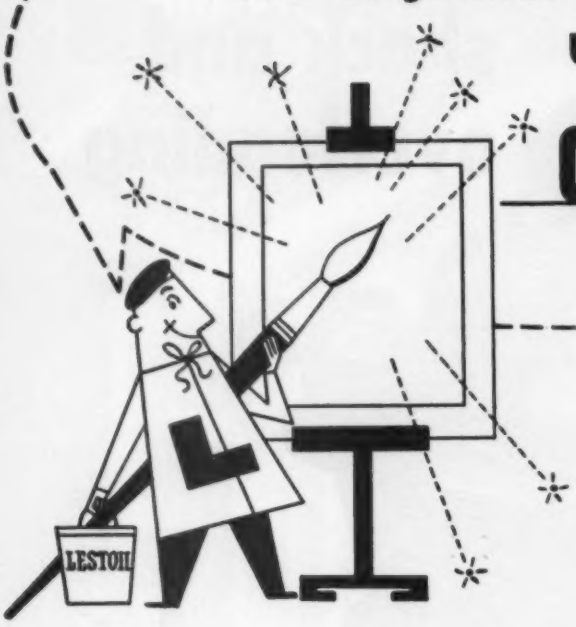

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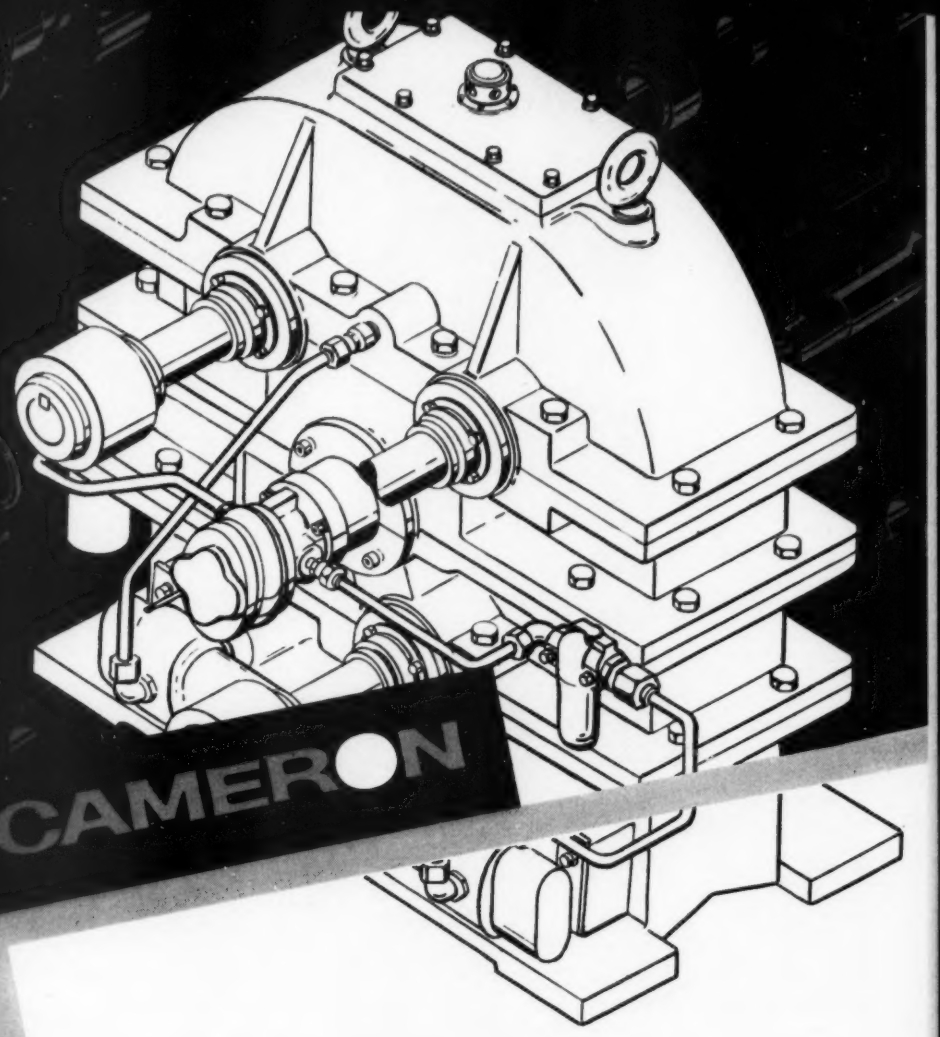

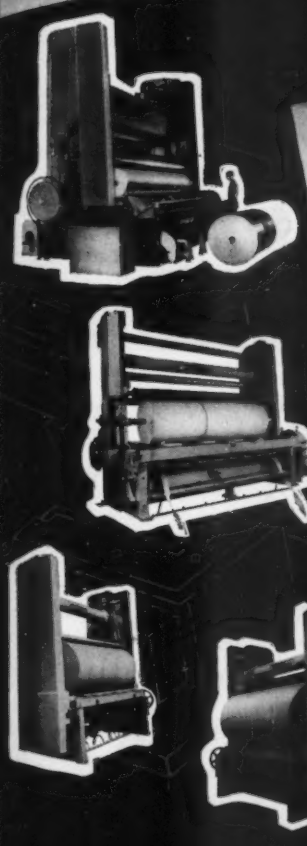

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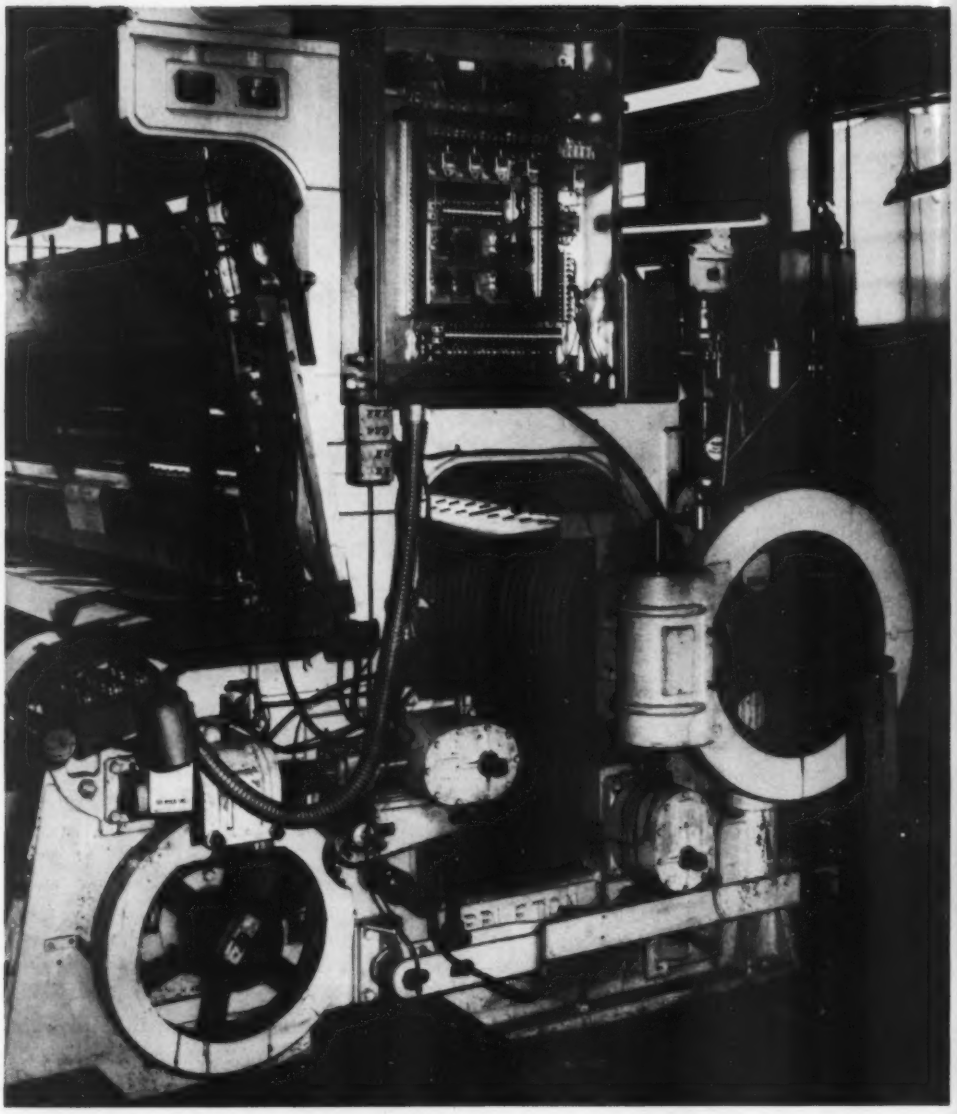

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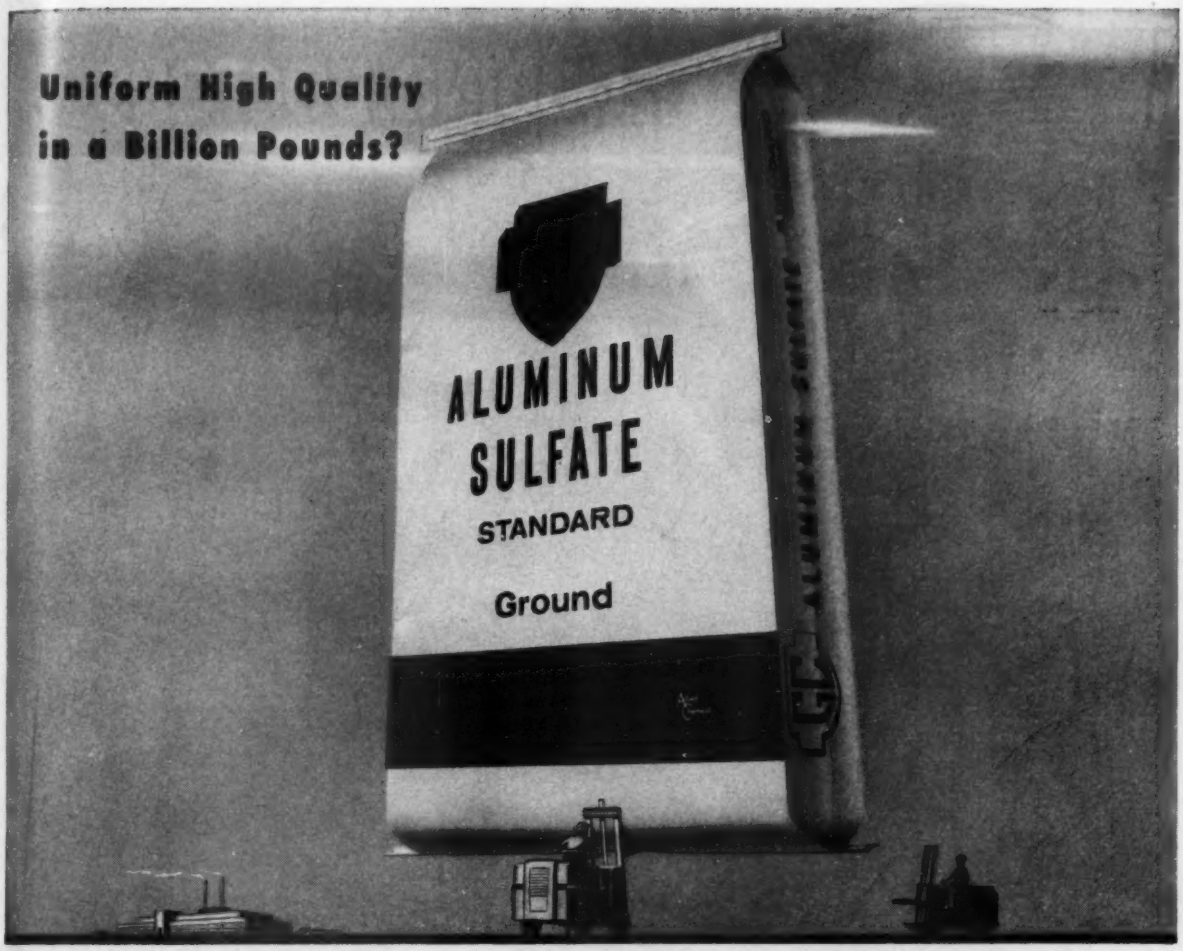

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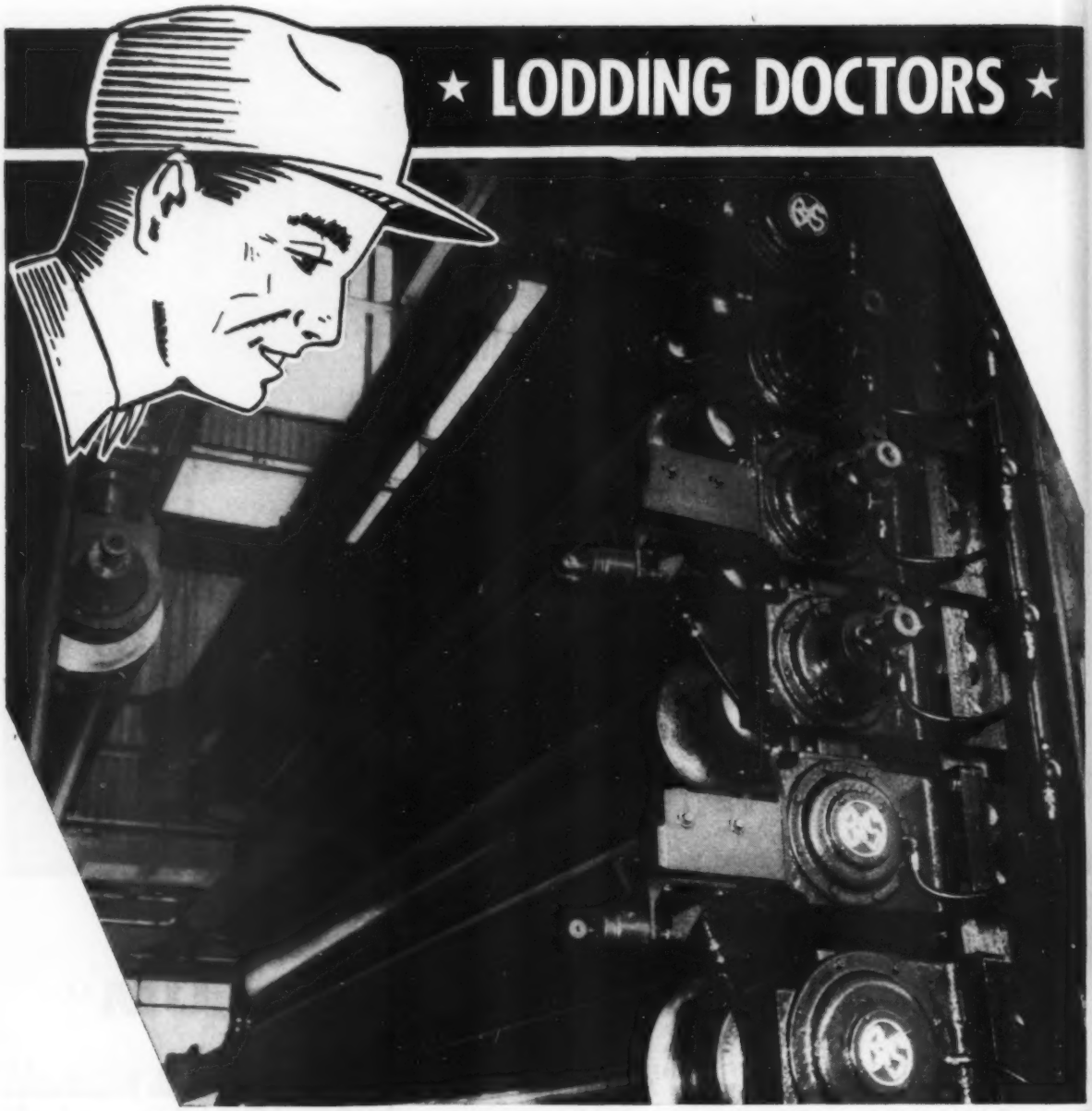

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Feature articles

Industrial Relations — where to?*

WILBUR M. McFEELY
Vice President, Riegel Paper Corp.

▶ **The industry faces a continued rise in wages and a labor shortage for the next five years. Emphasis is on increased productivity.**

IN THE FIELD OF LABOR relations, union demands inevitably conflict with the twin objectives of a business enterprise, i.e., profitability and survival. This conflict is readily apparent where it concerns labor's economic demands. It is less evident in the more insidious demands that are designed to restrict management's freedom to manage. I am not passing judgment nor implying that all of these demands are unjustified. For example, while a negotiation of grievances must necessarily be restrictive, few would decline to argue that it is not only desirable but, if not abused, serves a legitimate and essential purpose. The point is that there is a limit beyond which prudent management cannot go without losing the flexibility and maneuverability essential to carrying out its program. Hence, in every negotiation, the chief executive ultimately faces one question: "How far can we go before we must, if need be, stand a strike?"

I hope sincerely that the day will come when negotiations can be carried on in an atmosphere free from emotionally charged name-calling and accusations of anti-unionism, pugnacity, piracy and parsimony. There are some encouraging signs, but the best that can be said is that the environment of labor relations is moving slowly and painfully toward greater maturity.

Wages will continue to rise

It is quite apparent that wage costs are of foremost concern to industry at present and that they will be for some time to come. Inflationary pressures on our economy are evidenced by the fact that during the past year prices have advanced about 3.5 per cent. This applies to both the consumer price index and the all commodity wholesale index.

It seems inescapable that wages will continue to rise in the years immediately ahead. This means that either prices will edge upward to the extent that wages exceed productivity increases or that profits will be squeezed.

The average hourly wage received by the paper worker has risen, over the past ten years, by 84 cents—a 69-per cent increase, as against 75 cents for all manufacturing and 64 cents for nondurable goods. During these ten years, 1947 to 1956, wages in pulp, paper and board mills have increased more rapidly than they have in the metal and automotive industries and almost as fast as in the chemical industry. Although it has not received the fanfare of publicity, the paper industry is nevertheless a wage leader, and it is reasonable to assume that it will continue to be one.

I do not want to leave the impression that I believe the wage picture in the basic paper industry will necessarily follow a trend line of the past ten years' experience. It has become a wage leader because it, like all other wage leaders, has been a growth industry, has enjoyed a period of relatively good profits, and because of heavy capital investment has attained a relatively high level of productivity. If there should be a radical change in these conditions, then any assumption about wage prospects would have to be altered accordingly.

Labor situation — a continued shortage

One factor contributing substantially to the wage inflation has been the labor shortage of the past decade. Since 1949, the population increase in the 18-to-64 age group has been about 4,800,000. This is highly subnormal and reflects the birth-rate slump of the 30's. Even this limited

*Abridged from a paper presented at the National Paper Trade Association convention.

increase has been largely absorbed by the armed forces, a rise in government employment, and in the defense industries. The increase available to private industry has been negligible in comparison to demand and, in addition, has been marginal in quality.

This situation is changing slowly. In the period from 1957 to 1965, the manpower supply is expected to show an increase of about 8,000,000. More than two-thirds of this increase will come in the second half of the period. Furthermore, the age group 25-45 will show scarcely any increase until the 70s. Thus, assuming a high level of industrial activity, we are likely to face a continuing shortage of labor for the next five years and in certain strategic age groups for the next 15 years.

Another factor in our economy has tended to accentuate the influence of this population curve. The nature of our technology is changing the demand for labor in the direction of skilled employees. Skilled labor has normally been in short supply. As further shortages develop, the wage structure of skilled labor will press upward and tend to raise the whole wage structure.

When the labor supply does begin to increase more rapidly, about five years from now, the wage pressures we have been experiencing could change, particularly if new job opportunities are not opening up as fast as people enter the labor market. In this event, the upward pressure on the wage level could be slowed down, or even halted. But there are too many if's, and's and but's to make this a certainty.

Emphasis on increased productivity

This shortage of labor relative to the demand for goods and services and the ever-mounting cost of labor have in turn placed a high premium on methods for increasing productivity. Although many labor leaders seem to ignore the fact, it is nevertheless true that increased productivity results very largely from capital investment and improved management methods.

It is fundamental that the key to the labor and social impact of automation, nuclear power, electronic data processing and other technological change is the rate of speed at which they are introduced and at which they spread from one undertaking, industry and area to another. If, as many have emphasized, the changes of the last 50 years had been compressed into the last five, there would have been economic and social chaos.

While it is important to try to assess the rate of speed at which technological changes are occurring and are likely to occur, it is clear that at the moment we have no real means of knowing how fast the changes will come and how far they will go. It is very clear, however, that the specter of these technological advances is raising serious questions concerning the impact on employment, skill, education and training, job satisfaction, labor mobility, wages and hours of work, industrial safety and security. It is also clear that competition among companies and other pressures for industrial efficiency and for new and better quality products will quicken the rate of change. Therefore, the industrial relations problems incident to rapid change which may seem distant could descend upon us quicker than we anticipate.

Shift to non-manufacturing jobs

There are two other trends that are significant for industrial relations people. First, the share of production workers in total manufacturing employment is on the decline. Production jobs represented less than 77 per cent of total manufacturing employment in May, 1957. This compares with 78 per cent last May and 84 per cent in 1947.

Secondly, the shift in employment to non-manufacturing jobs has recently passed an important statistical milestone. In early 1947, 54 per cent of the work force was employed as farmers, farm laborers, craftsmen, operatives or laborers in manufacturing or construction. These are jobs that are usually classified as "goods production." In 1956, evidently for the first time in history, over half of the work force was employed in non-goods-producing employment. These include services, trade, clerical jobs and the professions. This year, the trend away from goods production has become even more pronounced, taking only 46 per cent of the total jobs, as compared with 48 per cent a year ago.

These shifts tell us several things. First, the increase in non-production workers in manufacturing adds to the difficulties of cost control at a time when profit margins are under pressure. Secondly, the shift to non-production workers together with the trend toward non-manufacturing employment portends new directions in labor's organizing efforts. Labor leaders see in these groups, who are largely unorganized, major sources of revenue and control. Furthermore, if they remain unorganized the relative influence of organized labor will be lessened. Hence, labor leaders may be expected to press organizational drives in these areas with increased vigor.

What new labor legislation can be expected?

Finally, let us take a brief look at the legislative prospects. The testimony brought out during the Senate investigations has given rise to all sorts of speculation. Personally, I believe it is too early to see what legislation will evolve. I would anticipate measures to regulate union welfare funds and to safeguard other funds. Efforts may also be made to guarantee the individual member more voice in the internal affairs of union power. I refer here to the closing of some of the loopholes in the law with respect to secondary boycotts, hot cargo clauses and recognition strikes.

The Senate hearings may create additional problems for management. Before going any further, let me emphasize that I am not in any sense critical of the hearings, which are long overdue. However, internal union friction and inter-union rivalry always complicate labor relations problems. In the end, it is management that bears the brunt of struggles for power among union leaders.

On the positive side, I hope the easy but fallacious belief held by various groups that identification with the labor movement automatically endows a person with a sensitive concern for the individual and a social conscience will be put to rest. Managers as a group are as concerned with the well-being of individuals as any other group in our society. If they did not have this concern by nature, managers would of necessity have to develop it, because they have an inescapable obligation to develop individuals who are able and willing to assume leadership obligations and responsibilities.

In the days ahead, I believe we have a great opportunity. For more than 20 years the cultural climate in America has moved gradually but surely toward a more favorable appraisal of the role of industry and of management in our society. This trend is evident in our popular literature and to some extent in our legislation. But, there is no guarantee that this trend will continue. Herein lies the challenge and the opportunity. Our skill in handling our industrial relations problems will be one dominant factor in determining whether this trend continues or whether it will retrogress. The task ahead is not easy. Although our industrial relations problems will require astute handling at all organizational levels, they must remain a high priority of top policy-making executives and particularly of the chief executive who, in the final analysis, sets the tone and pace of the program in his organization.

Characteristics of steam control valves

LEO WALTER

A typical installation of piping and valves in a paper mill. (Courtesy Bristol Instrument Co.)

Incorrect valve sizing, more than any other single factor, is responsible for poor performance of an automatic controller.

SELECTING THE correct type and size of a steam control valve is not as easy as it often seems. In order to efficiently control steam flow in a pipeline a number of factors have to be taken into consideration whenever some form of control is requested. To select the right type and size of a simple shut-off valve for steam flow is easier. The valve aperture being either fully open or fully closed, the question of throttling duty does not arise. Provided that the steam pipe has been correctly dimensioned and that demand for steam is fairly regular the valve size will correspond with the pipe size. The shape of valve disc or seat is also of less importance than where throttling has to be performed.

In open-and-shut or two-step control of steam flow to a heating process the factor to be considered is speed of valve opening and closing, as will be seen later. For throttling control duties in gradual heat process control a number of factors have, however, to be considered, otherwise control might be less efficient.

Basic factors for steam control

When dealing with automatic steam control in manufacturing processes the regulating unit or final control element is usually a valve. It is the last unit in the range composing an automatic control system, namely detecting element D (Fig. 2), measuring section of the control mechanism M, controlling section C, which also embraces a power amplifier A and control valve V.

Looking at the "closed loop" of a controlled industrial process (Fig. 3), it will be seen that the control valve comes (1) at the end of the parts composing an automatic controller, and (2) at the beginning of the controlled industrial process, which is also an integral part of the closed loop or process cycle. This explains why design, function and characteristics of control valves play an important part in achievable accuracy of control. Process characteristics demand a definite speed of value of valve disc movement in accordance with the amount and progression of a process disturbance which requires correct control action.

The change of valve lift has to start as quickly as possible once process balance has been disturbed; but the speed and acceleration of the valve disc movement must keep time with development of the deviation, which has to be controlled, whatever gradual form of control may be applied. Valves for two-step control (on-off) or three step control (high-medium-low), however, act differently, because they are either fully or partly open or fully closed without intermediate stages.

Nevertheless, even with this somewhat crude but in practice often astonishingly accurate control, the time elapsing between fully open and fully closed valve position has influence on achievable accuracy of control. It is, therefore, important to select the correct type of control valve for each process control problem, just as the correct mode of control has to be performed by the controller mechanism.

Two-step control

Dealing first with control valves used for two-step (on-off) control, they are either fully open or fully closed and work on a time basis. Their general design will be similar to gradually operated control valves, but the disc and valve opening is less important, and beveled disc globe valves are often used. On-off control valves can be actuated from self-operated or from power-operated control mechanisms.

Another frequently used type of two-step (open-and-shut) valve uses magnetic power for its action. When energized the solenoid attracts an iron core fixed above the valve stem and disc, and when current is stopped the valve disc closes by gravity.

More elaborate magnetic valves use a pilot mechanism. Motorized control valves can be either of the two-step (on-off) type (for example, when

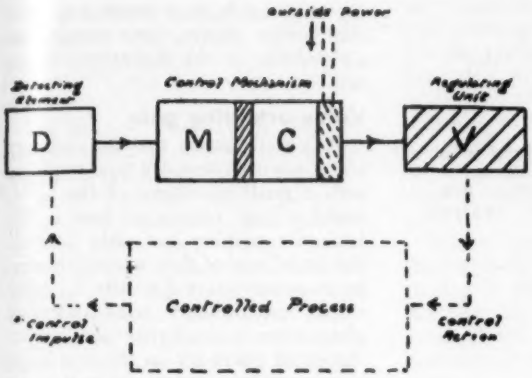

Fig. 2—Closed loop of controlled heat flow process.

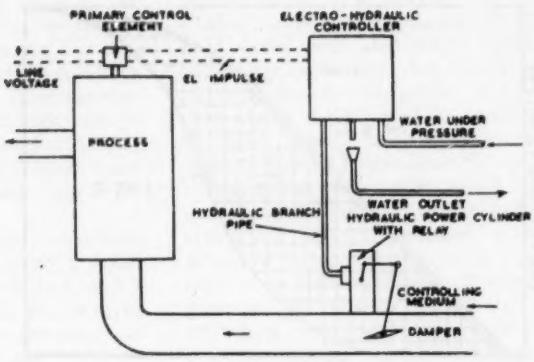

Fig. 3—Electro-hydraulic damper control shows control cycle.

used with the usual control switches, such as thermostat-, pressure-, or level-switches, or with microswitches), or they can act gently and gradually. The gradual operating motorized valve is now coming into wider use due to recent designs for proportional control mode (Fig. 4).

Into the group of power-operated control valves come also two-step valves using either compressed air or water or oil under pressure for their operation. Pneumatically- and hydraulically-operated two-step control valves are similar or identical in design with gradually operated diaphragm- or power cylinder-operated control valves. A typical motorized multistep control valve operating in three or more steps works with a contactor mechanism. The valve moves in several small steps from fully open to fully shut position, according to electrical signal impulses from a suitable multistep control switch.

Characteristics

Achievement of control by means of two-step valve action is shown diagrammatically in Fig. 5. It is obviously solely a function of time of opening and closing. For temperature control, admission of steam during a certain period can be reduced by shortening the time of valve opening and *vice versa*. Times for reversing the valve position are very short for magnetic and self-actuated pilot-operated valves, but they can be longer for motor-operated control valves. The gear of the latter can, however, be designed for single or for double constant speed, or for progressive speed, as required for good control action.

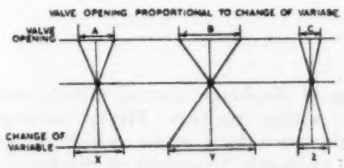

Fig. 4—Correlation between opening and control valve and change of steam flow.

The method of sizing of two-step control valves is comparatively simple. All that is required is that the pressure drop across the valve is small provided that the fluid pipe is correctly dimensioned. For steam supply pipes to process vessels the pipe diameter is, however, often over-sized. It is therefore, essential to choose a valve which produces the correct steam velocity when fully open.

Throttling valves

Gradually operating automatic steam control valves (Fig. 6) have various characteristics. A commonly used classification is made according to the method of opening and closing. For example, a temperature control valve which closes with rise of process temperature (heating process) is called "direct acting", but when opening with rise of process temperature (cooling process) it is called "reverse acting". For pneumatically-operated valves the terms "air to close" and "air to open" are used.

The need for both diaphragm control valve types can be realized from what would happen if trouble would cause air supply pressure to fail. For example, it is essential for safety rea-

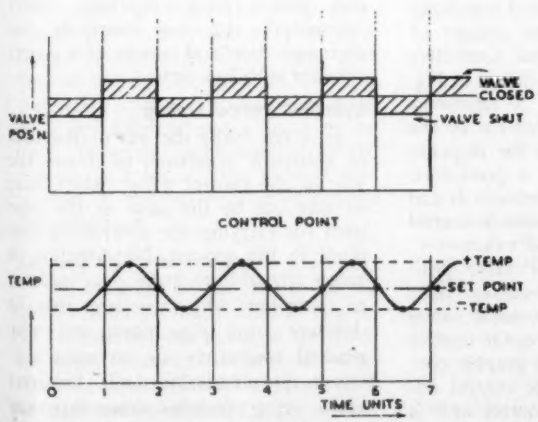

Fig. 5—On/off (open-shut, two-step) control mode of steam flow.

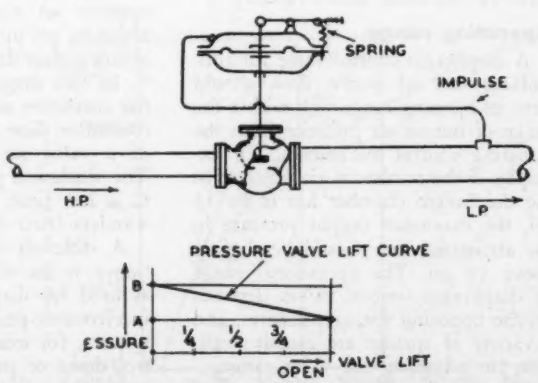

Fig. 6—Steam pressure control using spring-loaded self-actuated reducing valve.

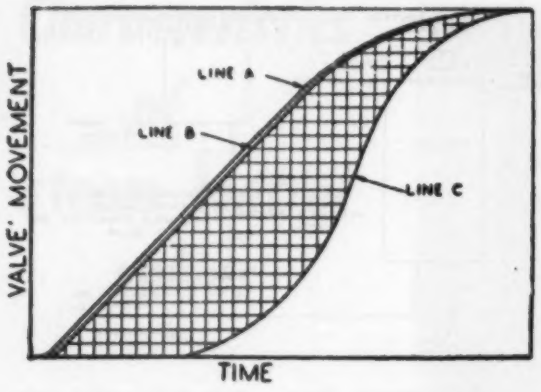

Fig. 7—Function of valve positioner on pneumatic diaphragm control valve.

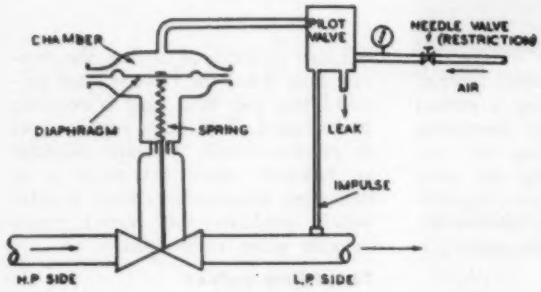

Fig. 8—Air-operated pressure controller with external pilot for precision control.

sons that for a heat flow process using steam as heating medium an air-to-open valve would be used. For cooling water control, however, an air-to-close valve would have to be used.

Steam control valves can be single-seated or double-seated, the latter used in larger sizes for higher pressure drops and where dead shut-off is not required.

Double-seated valves are often semi-balanced, thus reducing the effect of varying pipeline steam pressures, enabling a constant valve position to be maintained. Obviously, the valve lift or stem travel of a double-seated valve can be less than for an equivalent sized single-seat valve of the same steam capacity.

Operating range

A diaphragm control valve for controlling rate of steam flow should have its opening range well within the range of output air pressure from the actuating control mechanism. For example, if the minimum air pressure in the diaphragm chamber has to be 15 psi, the maximum output pressure in the air branch-line should be slightly above 15 psi. The operational range of diaphragm control valves depends on the opposing spring pressures, and a variety of springs are usually available for adjusting the valve range.

Friction of valve parts in general and of the valve stem and gland packing of diaphragm control valves causes wrong position. Heavy moving valve parts have inertia, which has to be overcome. Hysteresis of diaphragm and/or spring might prevent the valve returning to its correct position. Low output pressures from the air branch-line would thus result in wrong disc position, and valve positioners are recommended to produce correct control.

Valve positioners

Special units are available which can be readily mounted on all types of diaphragm valves and pneumatically-operated lever motors. The effects of friction, flow of steam through the valve body and unbalance requires an air pressure change of about ¾ psi up to 1¼ psi. Corrective action is thus delayed as shown in Fig. 7. In this diagram line A represents the corrective action called for by the controller; line C shows the response of a valve fitted with a positioner. The shadowed pattern between B and C is lost time, during which control wanders from the desired value.

A different design of valve positioner is an electric-pneumatic relay as used for diaphragm control valves in electronic-pneumatic remote control systems, for example for graphic control desks or panels. The control impulse from the panel control unit is an electrical impulse, but the positioning relay mechanism transforms electric current changes into changes of air pressure in the diaphragm chamber.

Valve actuating gear

It is well known that the ordinary screw-down globe valve type produces with a small movement of the hand-wheel a large change of flow in the just-open position but only a small change of rate of flow when it is near its maximum valve disc lifts. In other words, an ordinary hand-controlled globe valve is usually too sensitive to change of valve lift in the first stage and much less responsive in the second.

Correct choice of valve size at fairly constant working conditions will avoid this too sensitive stage. For example, self-operated temperature controllers will be sized so that at average rate of flow the valve disc is at about ½ of its maximum lift. Whenever flow variations cause a control steam valve to operate too frequently near its seat, "wire-drawing" might result and increase maintenance of valve seat and disc. Needle valves or ball valves can be used for smaller valve sizes. Specially shaped V ports give various desired valve characteristics.

The valve-actuating gear can include a diaphragm motor consisting of a flat or bellows diaphragm carried on a metal frame, with air pressure on one side and balancing spring pressure on the other. It may be a valve motor, and the usual diaphragm movement is about ½ in. for working diaphragm chamber of 15 psi (Fig. 8).

Power cylinders are often used for larger forces, for example for lever valves or lever motors hydraulically operated. The use of solenoids as positioning gear has already been mentioned. Electric motors can be ac or dc types. Small motorized valves run in both directions with reversing switch and travel limit switches. Valve "thrusters" also use electricity for their operation and consist of a power cylinder with link arm.

Control valve sizing

It is not really the job of the user of automatic regulators to choose the size of the control valve, which may or may not be the same as the pipe used for carrying the controlling medium to the process. Nevertheless, it seems advisable to make clear to users of controllers why valve sizes may be different from pipe sizes, and why gradual controllers use so many different types of valve discs. Incorrect valve sizing, perhaps more than any other single factor, is responsible for

poor performance of an automatic controller, which might otherwise give full satisfaction to the user. Correct valve sizing cannot be over-emphasized.

The basis of correct valve sizing is reliable figures of working conditions for the control valve. The manufacturers of controllers supply tables or graphs giving the various rates of flow of their valves under definite conditions. The users must supply data for defining these conditions. These data must be complete and correct.

The most difficult factor is usually the pressure drop across the valve under actual working conditions. It is well known that the flow capacity of a control valve depends, among other factors mainly on:

1. **Pressure differential between inlet pressure and outlet pressure.**
2. **The amount of inlet pressure.**
3. **Physical properties of the fluid conveyed.**

Gradual controlling valves

For sizing pipes carrying a fluid from one place to another, it is usual to allow a certain pressure drop, and to calculate the pipe size that will not exceed this pressure drop. It is essential to keep the pressure drop in the piping system as low as possible. Restriction of the supply pipe area in front of a control valve is thus avoided (Fig. 9).

The fundamental rule for valve sizing is that the area of flow through the fully open control valve must be the smallest orifice area in the whole supply pipe. The main pressure drop must take place in the valve itself. Varying back pressure is bad for closeness of control, and it is advisable to fit the control valve as close to the process equipment as possible to avoid unnecessary transfer lags caused by back-pressure in long lengths of a supply pipe.

Valves working on gradual control have to provide minimum and maximum rates of flow, and it is paramount that both these rates of flow should be well within the linear portion of the flowlift curve of the control valve. This explains why valve discs of different shape have to be used. These are recommended by the makers according to the flow characteristics of the valve to meet process characteristics.

On-off control valves

The selection of the correct size of two-position or multi-position control valves differs from sizing of the gradual type, because these control valves have no intermediate throttling position. Assuming that the pipe size has been correctly chosen, the control valve size may often be equal to the pipe diameter. It depends on the allowable pressure drop across the control valve, and on working conditions in general, whether the valve size corresponds with the pipe diameter or has to be smaller. It is obvious that the effective size of a control valve cannot usefully be greater than the pipe size.

It is of great importance to achieve dead-shut-off without creating hammering of the disc on its seat, and a damping device should be incorporated in the design to prevent wear and damage of disc or seat.

Accuracy of control and valve sizing

Correct sizing of control valves, whether of the on-off type or of the gradual type, is most important for achieving accuracy of control. The makers of control valves use actual tests and formulae for calculation of seat diameter and valve lift. The users of control valves, however, prefer tables or graphs for valve sizing, as issued by the makers. Methods of sizing pipes cannot be applied for sizing of control valves. It is obvious that for gradual control the velocity of the fluid varies with each small control movement of the valve disc, thus varying continuously the actual pressure drop across the valve. This variation of valve opening creates changes of rates of flow and provides differential pressures across the valve, which follow the rules for a "variable orifice area". For practical purposes, calculations of this nature are out of question, and practical tables or nomograms are provided by the makers for estimating purposes. The final size of a control valve should always be checked and decided by the makers of control equipment.

As a general rule, the size of steam control valves is nearly always smaller than the diameter of the pipeline in which they are being installed. This ensures that the area of valve opening will be the smallest aperture within the whole pipeline, as requested for good control.

Accuracy of control and valve size are closely interconnected. Oversizing

(Continued on page 784)

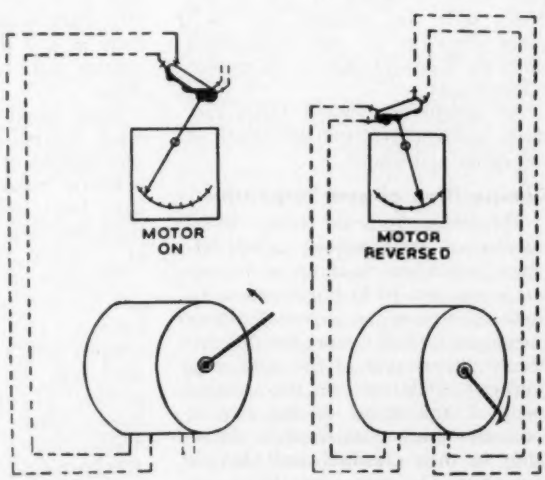

Fig. 9—Floating mode of control using mercury switch and control motor.

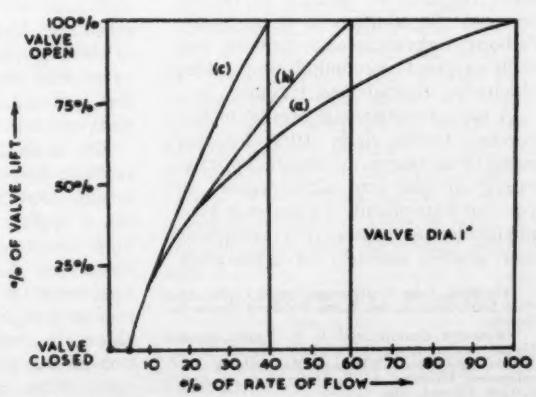

Fig. 10—Effect of piping on flow lift characteristic of steam valve.

Recent advances in pine gum chemistry*

JOHN C. BRAUN**

New products from turpentine show excellent qualities as plasticizers and lubricants; esters from condensation reactions of rosin and fumaric acid yield excellent varnishes.

PINE GUM, or more properly oleoresin, is the viscous solution of resin acids, terpenes and other materials that is exuded by various species of pine when wounded. In the United States only the longleaf and slash pines growing in the southeastern states yield enough gum to be worked commercially.

At present the United States produces annually $100,000,000 worth of turpentine and rosin.

Composition of gum turpentine

Turpentine consists chiefly of a number of hydrocarbons called terpenes, which are made up of 10 carbon atoms and 16 hydrogen atoms. In domestic turpentines, α- and β-pinene predominate (and account for approximately 90 per cent of the total components). Differences in the arrangement of the atoms in the terpene molecules cause considerable differences in their chemical and physical properties. Depending on the source of the turpentine, small quantities of other terpenes are present in varying amounts. In addition to these hydrocarbons, turpentine also contains partially-oxidized compounds — esters, aldehydes, alcohols and ketones.

A typical commercial sample of turpentine (90% slash, 10% longleaf gum) was found to contain approximately 56 per cent *alpha*-pinene, 32 per cent *beta*-pinene, 2.4 per cent *beta*-phellandrene, 1 per cent camphene and smaller amounts of *alpha*-phellandrene, limonene, myrcene and terpinolene. Thirty-eight commercial samples examined had compositions of 55 per cent α-pinene (aver. 61) and 34-26 per cent β-pinene (aver. 30). Pure longleaf turpentine contains more α- and β-pinene than slash turpentine and has little or no α-phellandrene.

Some progress has been made toward separating the rosin acids by precipitation of their amine salts. Levopimaric, neoabietic and *l*-abietic acids have been isolated by this method. Complete success awaits the discovery of a specific amine for each acid.

The use of partition chromatography has also been quite successful for analysis. Techniques have been developed which have resulted in the separation of the acids into the groups: (1) palustric, (2) levopimaric, *l*-abietic, dextropimaric and isodextropimaric, (3) neoabietic, (4) dehydroabietic, (5) highly polar acids, possibly four non-characterized acids. Further investigation may permit other individual acids to be isolated. In the meantime, ultraviolet spectral analyses of these groups have made it possible to estimate the percentages of most of the individual acids present in the gum or rosin.

The acids in rosin are not the same as those found in the oleoresin of its origin. Isomerization during processing is quite extensive because of the high temperatures and the acidic environment. Levopimaric acid, which may comprise nearly one-third of the acid content of the gum, is completely absent in rosin. A considerable portion of this acid should remain in the rosin if the turpentine were distilled at reduced pressure or after neutralization of the rosin acids. Special rosins containing some of this acid have been prepared in this manner, and the presence of small quantities of levopimaric acid in such rosin is expected to impart better paper sizing qualities.

The composition of the acidic portion of pine gum is approximately: 22-30 per cent levopimaric, 10 per cent *l*-abietic, 15 per cent neoabietic, 11 per cent palustric, 5 per cent dehydroabietic, 8 per cent dextropimaric, 8 per cent isodextropimaric, 13-21 per cent non-characterized.

A typical composition of the acidic portion of gum rosin is: 20 per cent *l*-abietic, 19 per cent neoabietic, 19 per cent palustric, 5 per cent dehydroabietic, 8 per cent dextropimaric, 8 per cent isodextropimaric, 21 per cent uncharacterized.

The most recent rosin acid to be isolated and characterized is palustric acid, first found in oleoresin from *Pinus palustris* (longleaf pine.) As indicated, it is one of the most abundant acids in gum rosin and makes on important contribution to the unique properties of this rosin. It is one of the isomerization products of levopimaric acid.

Of the neutral portion, two aldehydes, destropimarinal and isodextropimarinal, have been isolated and identified. Two alcohols have also been isolated. One of these, elliottinol from *Pinus elliotti* (slash pine), has been partially characterized.

New products from turpentine

Of the products from turpentine, pinic and homopinic acid esters have

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*Abridged from a paper presented at the annual conference of the Forest Products Research Society.

**Research chemist, and E. L. Patton, head, Naval Stores Research Section, Naval Stores Station, Southern Utilization Research & Development Division, U. S. Department of Agriculture, Olustee, Fla.

Some of the more recent uses of chemicals in the manufacture of wood pulp

WARREN BEAZLEY*

Part IV—Wetting agents used in the hot caustic extraction stage of pulp bleaching

A HIGH PERCENTAGE of all the pulp produced today finds its way into paper, boards and shipping containers. However, an increasing percentage is being used in the production of regenerated cellulose and cellulose derivatives. Among these may be mentioned viscose rayon of both textile and high-tenacity grade, cellophane, staple fiber, cellulose acetate, nitrocellulose, carboxymethyl cellulose, hydroxyethyl cellulose, etc.

In many of these applications it is necessary to have a pulp that has a low resin level—or, if you like, a low methanol-benzene soluble content.

This resin level is influenced by a number of factors, among which may be mentioned: the species of wood used, its age, the degree of seasoning, the cooking process employed and so on.

It is common practice to make use of one or more of the bleaching stages to excercise control over the resin content of the fully-bleached pulp. A common bleaching sequence is one consisting of three stages: chlorination (for hypochlorite), followed by hot caustic extraction, followed by hypochlorite or chlorine dioxide bleaching (or a combination of ClO_2-hypo).

In the hot caustic stage from 4 to perhaps 10 per cent NaOH on pulp is used; temperature is 95-100° C. and time about 2-3 hours. Under these conditions the resin acids and fatty acids of the wood resin are saponified into water-soluble material and thus removed. There is a hydrolysis of esters, and some resin is removed in this way. The soaps of the resin acid and the fatty acids may themselves act as emulsifiers or surfactants and thus assist in the removal of the unsaponified components of the original wood resin.

While the above mentioned mechanisms produce sufficient resin lowering in some pulps, there are other pulps that do not end up with the desired low resin content.

It has become more or less standard practice, then, to add to this hot caustic extraction stage certain substances that will further assist in removing resin. In the past such things as soaps, sulfonated oils and phosphates, either singly or in combination, have been used.

With increasing demands on the purity of the pulp, the stage was soon reached when even these materials did not reduce the resin content to a low enough level.

And thus started a more or less systematic search on the part of pulp makers and their research departments for better methods and agents for removing resin from their pulps.

According to U. S. Patent No. 2,716,058 of Rapson and Wayman, assigned to C. I. P., the following classes of deresinating agents have been found to be effective in lowering resin content: they are the condensation products of ethylene oxide with various organic substances including phenols containing an aliphatic side chain, aliphatic alcohols, aliphatic acids, cyclo aliphatic acids and natural products such as resin, tall oil and cashew nut shell oil. Some especially useful chemicals may be mentioned. These are: ethylene oxide condensation products with octyl phenol, nonyl phenol, dioctylphenol, lauryl alcohol, tall oil, cashew nut shell oil and rosin.

It should be pointed out that the percent of ethylene oxide condensed in the compound is very important—there is a certain optimum value that some investigators believe changes, depending on the surfaces which are to be wetted. While the mechanism is not entirely understood, it is thought to be associated with the hydrophilic-hydrophobic nature of the wetter. Obviously, there is a need here for more research and development.

Now the popular conception of a wetting agent is "that a little goes a long way"—so you will ask what is the potential market for a good resin-lowering wetting agent? The materials I have been talking about are used at the rate of about 0.5 to 1.0 per cent on pulp or, taking the higher figure, 20 lb. wetting agents are used in the production of 1 ton of pulp. A 200-ton pulp mill, therefore, might use:

$$\frac{20 \text{ lb./ton} \times 200 \text{ tons/day} \times 300 \text{ days/year}}{2000 \text{ lb./ton}} =$$

600 tons/year.

At 30c/lb. this would amount to $360,000.

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Lighting in the paper industry*

D. R. PHILLIPS**

Part III — Lighting in shipping and receiving areas, stock and tool rooms, offices; the importance of a pleasant visual environment and good maintenance.

IN THE SHIPPING and receiving areas the most difficult visual tasks consist of making out forms, checking labels and stock, packing and wrapping, etc. These areas should be lighted in much the same fashion as the general manufacturing areas. A 50-footcandle level supplied by upward light, 2-lamp fluorescent equipment in continuous rows on 10-ft. centers, gives uniform lighting as shown in Fig. 13.

For the more casual tasks of loading, rough crating, etc., lighting levels of 20-25 footcandles are more typical. These may be obtained by omitting one half of the reflectors of a continuous row system. Should the area be used later for manufacturing processes, the higher production lighting level is readily obtained by completing the continuous rows through the installation of the remainder of the reflectors and auxiliary equipment.

In many areas of this kind, a service desk is located adjacent to the stock room. If this is the case, it should be well illuminated for the efficient handling of stock and the record work that is necessary. A continuous row of 2-lamp fluorescent equipment over the length of the counter is usually adequate for this purpose.

Stock and tool rooms

In all manufacturing plants it is necessary to devote a considerable amount of space to the storage and handling of tools and small parts. This is usually done in stock bins placed in rows on either side of relatively narrow aisles. The aisles are usually about 3 ft. wide, and the bins are approximately 7 ft. in height. The lighting requirements in an area of this kind are primarily supplying illumination on the vertical surface of the boxes and cartons stored in the bins and on the bin itself. In all cases the primary requirement is to supply vertical illumination. One of the better methods of lighting this type of an area is by utilizing continuous rows of single-lamp fluorescent equipment down each aisle. Fig. 14 illustrates a stock room lighted in this manner. It will be noted that the lighting units are mounted in the center of the aisle approximately at the top of the upper bins, and that they provide adequate light sideways toward the bins. It is highly desirable that these units be mounted no higher in order that the light reaches the inside of the bins efficiently. It is also very helpful to finish the inside of the bins and floors in light colors to reflect light to all parts of the bins. In some types of bins, small aprons project into the aisle at the lower front of each bin. If this is the case, these aprons should be finished in a high reflective paint in order to redirect some light into the interior of the bin.

Warehousing

There are in general two types of warehousing operation. Active warehousing consists largely of temporary storage of material used in current production or prior to shipping. This type of warehousing justifies lighting levels of 30-50 footcandles in order to facilitate the handling of material and minimize the hazards of trucking traffic.

The other type of warehousing consists of storing materials that are needed only occasionally. These materials may consist of spare parts, special low-demand paper types, etc. The lighting in this type of area is usually a lower level than necessary for active warehousing. Generally, between 20 and 40 footcandles.

Office areas

The seeing tasks in the office areas are generally prolonged and often difficult. The lighting should provide a pleasing, comfortable visual environment for the employees. People work better in this kind of surrounding. This has been confirmed many times by experience and actual tests. One of the more recent tests showed a performance increase of 5.5 per cent after the lighting was changed from 10 to 50 footcandles and light wall and furniture finishes provided.

The trend in lighting is continually toward improved seeing conditions. As new developements in light sources and lighting equipment improve lighting and decrease its cost, more light is demanded. As costs of office operation increase, the most efficient utilization of employee capabilities is more and more imperative. Lighting is a potent factor in this improvement. There are, of course, some office areas, such as lobbies and reception centers, where the seeing tasks are relatively casual and lower lighting levels can be used. On the other hand, there are other office tasks considerably more severe than the average, such as bookkeeping, detail drafting, etc., where higher levels of lighting are appropriate. For tasks of this kind, lighting

*Presented at the A.I.E.E. Pulp & Paper Industry Conference.

**Lamp Division, General Electric Co.

Fig. 13—Lighting in shipping and receiving areas requires a 50-footcandle level.

Fig. 14—Lighting in a stock room by means of single-lamp fluorescent equipment.

levels of 100-plus footcandles are desirable.

Visual environment

It has been indicated previously that good lighting requires a pleasant visual environment.

This means that all brightness in the area should be of the same order of magnitude. Strong differences in brightness create disturbing reactions. High brightnesses, such as are created by bare lamps and high brightness window areas, cause severe glare conditions which interfere with seeing and induce eye strain and fatigue. Shiny surfaces such as polished or glass desk tops reflect these high brightnesses into the workers' eyes causing reflected glare. It is particularly important that these glare conditions be reduced to a minimum. In order to create a pleasant visual environment it is very important that all surfaces in the room are finished in light colors. The finishes should be non-glossy for comfort and best appearance. If reflections are present, they are distracting and often mask the color and pattern of the surfaces.

There are very few exceptions to the rule that ceilings should be painted white. Without exception they should be of very high reflectance to keep lighting efficiency high and to give a luminous background against which fixtures are seen. The outside surfaces of fixtures should also be of high reflectance, for the same reason—to minimize the brightness difference between the inside and outside of the units.

The side walls from either the ceiling or the fixture line down should be finished in a color which has a reflectance of 50-60 per cent. Floor areas should have at least a 20 per cent reflectance, while furniture and equipment finishes should have a reflectance of 30-35 per cent. The desk tops and other work surfaces are especially important and should reflect 30-35 per cent of the light that strikes them. By utilizing materials of this reflectance a comfortable over-all brightness condition is created which contributes to higher production and improved employee morale.

Some care should be exercised in choosing particular colors so they harmonize with each other, but many different shades can be used as long as they are handled in a harmonious manner.

Maintenance

One of the most important problems in lighting of paper mills is the severe rate of depreciation due to dust and dirt accumulation on lighting equipment and other room surfaces. It is particularly important to keep in mind that a lighting system is installed for one purpose only: namely, to supply the necessary amount of light at the minimum cost and in a manner to help create a comfortable visual environment. In many mills throughout the country under existing maintenance practices of no regular cleaning, the lighting system is delivering only 40 per cent or less of the light that it is capable of producing. By a very small investment in a cleaning and lamp replacement plan, often less than 20 per cent of the operating cost of the lighting system, it is quite possible to realize twice as much light as the system is presently producing. Under these conditions, unit cost of light (the cost per footcandle actually delivered on the work) has been reduced by nearly one half.

Often maintenance costs can be reduced appreciably in very dirty loca-

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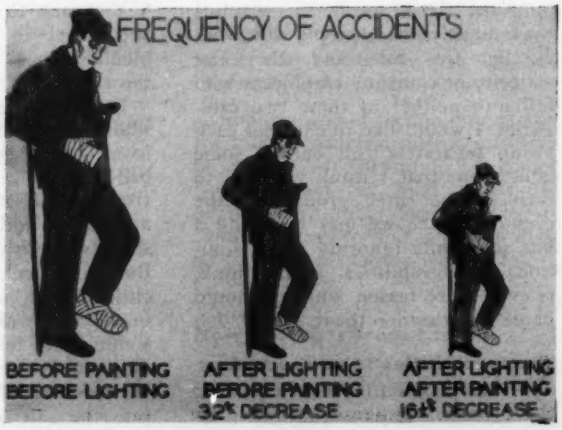


Fig. 15—Reduction of accident frequency by good lighting.

My responsibility to others in my company

RAYMOND R. DRISCOLL*
Marketing Research Manager
Keyes Fibre Co.

▶ In this prize-winning essay of the Tenth Bolton Award series the author shows great insight into the problem of responsibilities to others.

MY THOUGHTS on responsibility do not relate directly to, nor do I believe them to be limited to, a particular job. Each of us has a very broad and general responsibility to everyone else in his company —as well as to the stockholders— to do the utmost to promote the welfare of his company. We might rephrase this and say that our basic obligation is to work hard and as well as we are able. Under such a definition, I am confident that almost all of us can rightly claim to be meeting our responsibilities. What I am here interested in are some of those areas that are often ignored in daily practice, but which I believe to be an intrinsic part of one's responsibility to the others in his company.

I have specific responsibilities to at least three groups of people in my company: those people for whom I work directly; those people who work directly for me, and the vast majority of company employees who fall into neither of these two categories. I would like to consider each group separately and outline some obligations that I think we have to each of the three groups. In the eyes of others, we may be doing a fine job while ignoring those additional responsibilities. This, I think, is even more reason why we should pause to consider them.

Responsibilities to our superiors

To the people for whom we work, the principal responsibility obviously is to work as effectively as possible along lines laid down by our superiors. If we are to do a completely responsible job, there are several things in addition to hard work that must be faced.

If you have formed a considered and firm opinion on a problem that is under discussion, you should have the courage to speak out honestly, and to hold to this opinion regardless of its unpopularity, even with superiors. You must be willing to stand by your opinion, if necessary, alone. You must be ready to accept the criticism of others and to accept it without resentment. However, once the decision to act has been made, even though your opinion may be passed over, you must jump in with 100-per cent energy and ability to see that the decision is successfully implemented.

You must think in company terms and never in personal or departmental terms to the detriment of the company's welfare.

It is certainly a mark of irresponsibility to indulge in gratuitous criticism of others. It is particularly bad to criticize a man's superior in front of that man. Of course, there are times and places where constructive criticism is called for. But instances where our sweeping criticisms are justified are not as frequent as we might think. Just take a minute to look back and consider how many times you may have been wrong. Promiscuous criticism can be detrimental to morale throughout the company, and morale is an important part of everyone's day-to-day responsibility. Good judgment and a sprinkling of charity often would keep us rightfully silent. While a certain amount of griping is healthy, personal sniping is detrimental to all. And it is often the critic, rather than the criticized, who suffers most. I would also put rumor in this "to be avoided" category. I fear that indiscriminate criticism is a wide-spread and popular pastime at almost all levels of responsibility.

It seems almost too obvious to merit mention that you must accept the results of your actions whether they be good or bad. "Buck passers" have no one's respect. All too often, however, when a mistake is pin-pointed, you will see people shift into high gear and retrace that tortuous route of—"Well, it wasn't my idea, Jim told me to . . ." or, "But you remember, Bill told me to go ahead with this . . ." in the hope of shifting ultimate responsibility to other shoulders.

Responsibilities to company employees in general

While there are usually a few people who work directly with us on our level, most of us have only infrequent contact with the great body of company employees who work around us. We have few direct responsibilities to most of these people. However, in contact with

them, we should try to be helpful, informative and, most of all, cooperative. Our most important responsibility as regards this group is cooperation. Potentially irritating situations just naturally arise from day to day. Maybe the Production Reports are a little late today; maybe Research didn't have that analysis done when you wanted it; maybe Personnel couldn't get you that extra man as fast as you would have liked. Such situations are a real test of your patience and cooperative spirit. Don't be a trouble-maker. Resist that urge to grab the phone and raise the roof. Just remember that the other fellow has a tough job to do and if you have the right to blow your top, so has everyone else.

Responsibilities to those who work under us.

The people who work directly for us comprise our area of greatest responsibility and greatest challenge. Whether they realize it or not, it is our responsibility to activate them to do the best job possible. We should supply constructive criticism and guidance in an attempt to improve the performance of everyone who works under our supervision. Ultimately, it is our own benefit to help them increase their efficiency.

Naturally, we must be firm while being fair and impartial in our dealings with all employees. We should do whatever we can to generate an atmosphere of harmony and cooperation.

Now the desirability of such maxims as these is readily recognized and acknowledged. Let us see that they are paid more than lip service. In my opinion, the key to successful and responsible supervision and administration is a genuine interest and desire to understand the people involved. We must try to understand them and their problems and should try to give them an understanding of our particular problems too. Don't just be a boss; be a friend. Take an interest in peoples' families, their social activities and their union. Talk fights, movies, television programs. Encourage them to come and talk over problems that they may have on or off the job. Foster initiative directed toward improving company operations with which they are familiar. If the company does not have a formalized program, then you keep your people informed of company operations and policies and how their jobs fit into the total company picture. You can do these things without being nosey and without pushing yourself into situations where you are not welcome. The routine of "my door is always open" has been worked to a fare-thee-well. Nobody else is going to make your decisions and no one should ever get the impression that he is. But, we should encourage people by letting them know that their ideas will get a fair hearing and thoughtful consideration.

It takes absolutely no ability to order a man to do something the way you want it done. It often reveals a lack of understanding. If someone is balky or resentful, find out why. If a person believes that there is a better, simpler or more obvious way to get a job done, the fact that your position enables you to tell him to do it your way solves nothing. It is up to you to at least attempt to have your people understand why things should be done in your way. Failing to sway a man to your point of view, you may then have to resort to your authority to get things done right. But, an attempt to explain and get an understanding will never go unnoticed. People need more of a motivation than just the pay check to do a good job, and it is your responsibility to supply that motivation.

Some people have the respect, admiration and loyalty of all who work for them. Others have little or none. Nobody is entitled to these things. You have to earn people's respect, their friendship, their loyalty. It is not necessary to be well liked to get a job done; but, how much easier, in the long run how much better for all concerned, if people do things for you because they want to rather than because they have to.

In summary then, my responsibilities to the others in my company extend far beyond simply working hard and long hours. I owe much more than that to all of them. Some may say that this is very altruistic and very impractical. I say high principles are practical. Our national growth, our political and business institutions, are based upon man's highest principles. It might be said that we in the business community have a responsibility to everyone everywhere who shares our faith in the individualistic, competitive enterprise system in this day of international, ideological struggle. The performance of each of us counts in the struggle just as surely as a man's vote counts on Election Day.

Pine Gum Chemistry

(Continued from page 776)

excellent qualities both as plasticizers and as lubricants for aircraft jet engines. Polymeric amides of these acids are the same type compounds as some of the modern synthetic fibers. It is possible that a very satisfactory synthetic fiber could be made from either acid.

Considerable research has been directed toward lowering the cost of these acids. Both are derived from pinonic acid, which is made by oxidation of *alpha*-pinene. The classical method for this oxidation requires the use of potassium permanganate. This is an excellent process for laboratory use but would be too costly for commercial production. Therefore, other means of oxidizing *alpha*-pinene are still being sought. Ozonization followed by hydrolysis under oxidizing conditions has shown promise. Yields are only about 50 per cent, however, and optimum conditions must be found for the reactions involved before commercial production can be expected.

Oxidation has also been accomplished by bubbling air or commercial oxygen through heated pinene in the presence of various catalysts. Although this has not yet produced pinonic acid in appreciable yields, some of the oxidation products may find other uses. One of these products, *alpha*-pinene epoxide, may find use in the field of epoxy resin plastics. Commercial production of this compound by another process has been announced recently.

Hydrogenation of pinene, followed by air oxidation, results in the production of pinane hydroperoxide. A slightly more complicated series of reactions leads to *para*-menthane hydroperoxide. These, compounds, the subject of recent patents, have been developed commercially as catalysts in the manufacture of synthetic rubber and other polymers. In fact, nearly all the present production of synthetic rubber for automobile tires involves the use of one of these peroxides.

Isoprene, one of the building blocks for making synthetic rubber, may also be made from turpentine. Although isoprene from petroleum is less expensive, turpentine does provide an alternate source for this important item on the list of strategic materials.

New products from rosin

Among the more recent products from rosin, which have considerable

(Continued on page 785)

New results at the 11th Alkaline Pulping Conference

TIMBER PLANNING and forest management, short wave ultraviolet absorption as a means of controlling kraft pulping, a slurry system for salt cake distribution, the use of additives in the clarification of white liquor, a new process for the manufacture of chlorine dioxide, cold soda pulping and peroxide bleaching of cold soda pulp, and fiberizing semichemical pulps — these were among the highlight topics discussed at the 11th Alkaline Pulping Conference held in Charleston, S. C., on November 5-7, 1957.

The shade tolerance of spruce pine is a quality viewed with increasing importance, since it permits the tree to regenerate itself in mixed stands with hardwoods, as reported by R. O. Koch and J. E. Sapp of the Gaylord Container Div. of Crown Zellerbach Corp. The yields and quality of spruce pine kraft pulps are about the same as those shown by pulps obtained from other pines. Spruce pine pulps, however, tend to be somewhat higher in burst and lower in tear strength characteristics.

Effects of varying sulfidity

Discussing the effects of varying sulfidity in southern pine sulfate pulping, James L. Dickerscheid of Champion Paper & Fibre Corp. reported the following conclusions:

(1) In the manufacture of bleachable grade sulfate pulp from southern pinewood, the active alkali basis for applying cooking chemicals to wood is better than the effective alkali in the range of 15-35 per cent sulfidity (basis total alkali) for maintaining a uniform pulp bleachability. When sulfidity varied in the range above 35 per cent, even the active alkali basis was not suitable.

(2) Unbleached pulp yield and screenings are directly related to permanganate number. This relationship is independent of variations in sulfidity and the basis of applying cooking chemicals to wood.

(3) Pulp quality, as measured by a ratio of viscosity to permanganate number, varied inversely with the amount of sodium hydroxide applied basis wood, regardless of the amounts of sodium sulfide and sodium carbonate applied.

Short wave length ultra-violet absorption — a means of controlling kraft pulping

In a series of investigations it was recently shown by T. N. Kleinert and C. S. Joyce that short wavelength ultraviolet absorption of the cooking liquors can be used as a measuring means in bisulfite cooking as well as in kraft pulping. Discussing the application of this technique in kraft mills at the 11th Alkaline Pulping Conference, Dr. Kleinert showed that kraft alkali-lignin isolated from commercial liquors exhibited a distinct absorption maximum at 205 μ and a flat shoulder at 280 μ. For a practical absorption measurement during cooking it is essential that extended heating of the liquor does not change its absorption properties. Also, a straight-line relationship must exist between the lignin concentration and the liquor absorption, particularly as high liquor dilution is used in ultraviolet photometry. By the experimental work these conditions were found to be valid. Measuring the 205 μ absorption of the appropriately diluted liquor directly tapped from the digester opens the possibility to interpret the readings in terms of delignification, permitting the operator to blow the digester at a predetermined state of delignification.

A primary condition for the application of this technique is that the liquor sample be representative. Tapping from the center of the circulation pump and immediate cooling to room temperature was found practical. Continuous liquor dilution can be achieved by feeding a constant small liquor flow into a constant flow of dilution water. By running the dilute liquor sample through a stream ultraviolet analyzer, a continuous recording measurement can be achieved. For mill purposes a rugged and easily serviceable prototype instrument has been developed and is being tested under commercial conditions.

The delignification curves (optical density of the liquor versus cooking time) so far obtained in the commercial cooks reveal the following facts:

Recycling of black liquor is no influencing factor when the initial reading of the cooking liquor is known.

Dissolving of easily accessible lignin substances from the wood surface and the diluting effect of the wood moisture influence the initial reading.

The measurement of delignification is influenced by the wood moisture, the wood-liquor ratio and the introduction of steam when direct cooking is used. Therefore, for interpretation of the delignification curves these data must be determined. It was found that the delignification curves give valuable information on the cooking.

Short wavelength ultraviolet absorption was also studied in brown stock washing. The absorption readings were compared with the visible light absorption and the electrical conductivity measurement. In all cases a relationship was found, indicating that in the wash waters the lignin can be determined more accurately by its ultraviolet absorption.

A slurry system for salt cake distribution

A unique method of salt cake distribution—in a slurry form—was discussed by O. J. Bristow, J. J. Owen and J. J. Yirak, Union Bag-Camp Paper Corp. In this distribution system salt cake is mixed with weak liquor to a high solids content in a mixing tank located at the storage area. The resulting slurry is pumped through a circulating header passing through the recovery room. At each recovery unit the required amount of salt cake is withdrawn from the header by a small metering pump and fed to that unit. Salt cake addition to all units is controlled from a single location.

The slurry system of salt cake distribution is claimed to be much cleaner, easier to operate, capable of closer control and less demanding of maintenance that the mechanical system which it has replaced.

The use of additives in the clarification of white liquor

F. G. Pavlick and J. J. McPherson, Mosinee Paper Mills Co., reported that by the addition of 80-160 ppm

of Separan to the white liquor clearer white liquor to the digesters can be obtained, and decanting of clear liquor over the sludge can be speeded up. The resultant sludge bed after settling is more compact, and there is also an indication that better washing in the sludge filter is obtainable as a result of the addition of Separan.

Re-use of black liquor

M. N. May and J. R. Peckham, the Institute of Paper Chemistry, reported that the active chemicals present in the black liquor diluted to a fixed active alkali concentration of 10 gr per liter were found to contribute to the pulping reactions roughly in proportions to their contribution to the total active alkali in the cook. The active contribution of the black liquor, however, appeared to diminish somewhat with repetitive cycles. The reuse of black liquor did not appear to have any deleterious effect on the strength properties or the bleaching characteristics of the pulp.

A new process for the manufacture of chlorine dioxide

W. Howard Rapson, University of Toronto, described a new continuous process for the manufacture of chlorine dioxide in which sodium chlorate and sodium chloride (or hydrochloric acid) are fed into a vessel containing sulfuric acid.

Of the 49 chlorine dioxide plants now either in operation or under construction, 32 depend upon the reduction of sodium chlorate by sulfur dioxide, while 16 use methanol, and one uses hydrochloric acid as the reducing agent.

In the new process very nearly the theoretical ratio of 2 moles of chlorine dioxide to 1 mole of chlorine is obtained under the following optimum conditions:

1. High acidity (e.g. 5 M H_2SO_4 or 7 M H_2PO_4)
2. Low chlorate concentration (e.g. 0.03 M)
3. Lower chloride concentration (e.g. 0.03 M)
4. Low temperature (e.g. 25-40°C).

The chlorine dioxide and chlorine produced may be used together, or they may be separated continuously in a counter-current absorption tower by means of water, in which chlorine dioxide is approximately 10 times as soluble as chlorine. The 10 per cent chlorine by weight remaining in the chlorine dioxide solution does no harm for pulp bleaching.

Among the advantages claimed for the new process are the following:

1. The generator can be of simple design because no heat exchanger is required, and a perforated tube gas bubbler may be used.
2. Chlorine dioxide can be produced at several times the normal rate by raising the temperature, increasing the acidity and allowing the chlorate to flow out at a higher concentration.
3. The generator can be safely shut down by merely stopping all flowing streams.
4. It eliminates the necessity of burning sulfur and the storage and handling of such a hazardous combustible solvent as methanol.

The major cost of the new process lies in the storage tanks, pumps, piping and instruments. The simplicity of the generator may lower the cost of a 3-ton per day plant by $5000.

The consumption of chemicals in the new process, however, is higher.

(Continued on page 784)

Steam required for bleaching

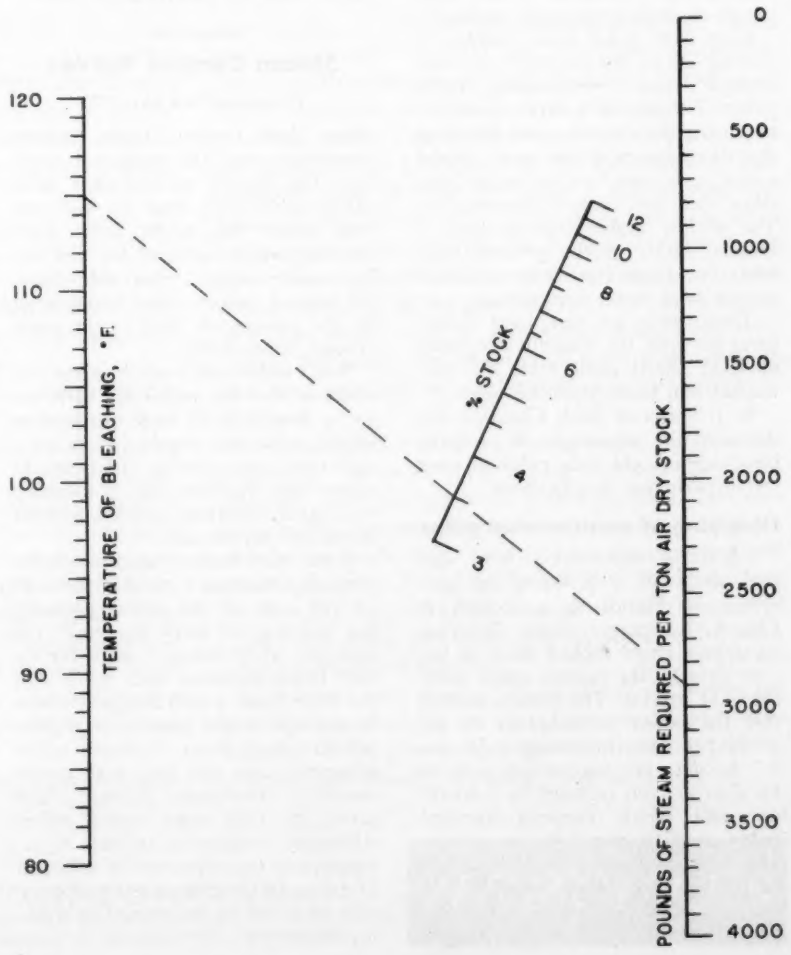
DANA S. DAVIS

THIS LINE coordinate chart, based on reliable data*, allows quick estimate of the weight of steam required per ton of air-dry stock for pulp bleaching systems where the bleaching temperatures and densities, expressed as percentage stock, are known.

An application

What is the weight of steam required per ton of air-dry stock when the temperature is 115°F and the stock density is 3.5 per cent? A straight line through the temperature scale at 115°F and the percentage stock scale at 3.5 per cent intersects the third scale at 2900 lb.

*"Paper and Pulp Mill Catalogue", published by Fritz Publications Inc., 33rd edition, page 410, 1956-57.



Generally speaking, the new process requires twice as much sulfuric acid as the methanol process and four times as much acid as the SO_2 process. Therefore, if the effluent is to be thrown away, the new process usually cannot make chlorine dioxide as cheaply as the Mathieson and Solvay processes. However, where byproducts from the new process such as chlorine and salt cake are recovered, the operation of the new process becomes more economical than others in locations where salt cake is expensive and sulfuric acid is cheap.

Cold soda pulping and bleaching

K. J. Brown, Forest Products Laboratory, U. S. Department of Agriculture, reported that pulps produced at temperatures of 23°-45°C and yields at about 92 per cent were suitable for bleaching and use in the manufacture of printing papers.

In the continuous pulping method, consisting of compressing and decompressing chips in the presence of caustic soda solution in a roll mill, 15 per cent less chemicals and 10 per cent less fiberizing energy are required than in the production of the same grades of pulp by the batch method.

Cold soda pulps from continuous cooking are on the average 5 per cent brighter than corresponding batch pulps. The use of a screw press between the chip treating and fiberizing operations indicated that more unused caustic soda could be recovered from chips that are treated continuously. The slightly higher concentration of residual alkali in the pressed chips from the batch treatments indicated greater wash water requirements.

There were no significant differences between the strength properties of hand sheets made from the continuous and batch-produced pulps.

R. J. Solari of Shell Chemical Co. discussed the advantages of peroxide bleaching of cold soda pulps to meet certain stringent specifications.

Fiberizing of semichemical pulps

Fiberizing experiments were carried out by W. J. Nolan of the University of Florida in a Jackson & Church Rotopulper using Brazilian eucalyptus chips cooked to a 65-per cent yield by the neutral sulfite semichemical process. The results showed that the power consumption on the 25-30 per cent consistency pulp was 4-7 hp days per ton compared to 10 hp days per ton reported by a southern mill which fiberized identical pulps at 8-10 per cent consistency. The laboratory pulps were found to be 8-12 per cent stronger in tear and equal or superior to the mill pulps in tensile and bursting strength.

Pine Gum Chemistry

(Continued from page 781)

commercial possibilities, are the esters of the condensation products of rosin with fumaric acid. These generally have higher melting points than corresponding esters from maleic anhydride modified rosin, a desirable property for many uses. Varnishes made from these esters have shown excellent qualities.

A somewhat similar product, maleopimaric acid, is made by reacting maleic anhydride with *l*-pimaric acid. This compound, now being made commercially, is unique in that it is the only pine gum chemical produced directly from the gum without prior conversion to turpentine and rosin. The product is useful in printing inks, resins and photographic chemicals.

Metal resinates from rosins which have been modified with formaldehyde are superior in most respects to resinates made from ordinary unmodified rosin. Production of these products is covered by widely licensed government patents. Very interesting new varnish resins have also been prepared from the methylolated rosin.

Steam Control Valves

(Continued from page 775)

causes bad control, erratic action, sometimes even the unwanted hunting. The disc of an oversized valve often works very near its seat and with steam this might cause wire-drawing, which damages disc and seat by erosive action from the steam. Undersized valves cause lengthening of the process, or they might make control impracticable.

Some makers of control valves recommend that the wide-open valve capacity should be 25 to 35 per cent in excess of the area required as an average from the process. This should ensure that the valve disc is normally in a good throttling position without being too near the seat.

Some valve makers recommend, for example, choosing a pressure drop of 15 per cent of the initial pressure, but this may be much too small, for example, when sizing a valve for direct steam injection into water. On the other hand, a well-designed steam-heated coil might cause a negligible pressure drop. Users of control valves sometimes state that they wish not to exceed a maximum pressure drop across the fully open control valve. Although it might be possible to accommodate the valve size to a certain extent to this request, the actual pressure drop will be determined by working conditions.

Effect of piping layout on accuracy

The effect of correct and incorrect sizing of piping on flow-lift characteristics of a control valve is shown in Fig. 10. Curve (a) shows the valve life and the related flow capacities through the valve on test, without piping. Curve (b) shows the same control valve, installed in a larger size pipeline (which is the usual method in practice). Curve (c) illustrates the same control valve, being installed in a pipeline having the same diameter. Its flow capacity is greatly restricted, and closeness of control is bound to suffer. It is, therefore, always advisable when installing control valves into existing plant and pipes to check carefully if the size of the supply pipe is correct.

Lighting in the Paper Industry

(Continued from page 779)

tion by using reflector type filament and mercury lamps. Since these lamps have their reflectors sealed inside, dirt and dust collection on the sides of the lamps does not reduce light output. Cleaning can often be eliminated where these lamps are used. The reflector filament lamps are the 500-watt, 750-watt R52 and the 1000-watt RB52. In mercury, the H400R1 and RC1 and the H1000RC15 lamps are available. The new Power-Groove fluorescent lamps also offer possibilities for reducing maintenance costs by reducing the number of lamps and equipment to be maintained.

No lighting system remains effective for any considerable length of time unless a definitely planned and well executed maintenance program is carried out.

Safety

The problems of safety in any manufacturing process are always of prime concern. Good lighting reduces the hazards in any process by insuring that the worker can see and avoid dangers. The chart in Fig. 15 illustrates the effect on accident frequency or relighting programs in the Allis-Chalmers Mfg. Co. Milwaukee plant. It will be noted that this chart includes not only results from relighting but repainting as well. Accidents in the erection shops were reduced by 43 per cent by this improvement in workers' seeing environment. Admittedly, such spectacular results cannot always be expected, but this chart does indicate the close inter-relation between good lighting and good safety records.

An Important Message

HERCULES ANNOUNCES PRICING POLICY CHANGE FOR ALL ITS GRADES OF PALE ROSIN SIZE

Hercules Powder Company's Paper Makers Chemical Department has announced a change in the method previously used for pricing all of its pale grades of rosin size. Effective January 1, 1958, size prices will be quoted on a "flat price" basis, rather than fluctuate with the gum rosin market. Prices will be announced quarterly and will remain firm for ninety days.

For approximately fifty years, originally as Paper Makers Chemical Corporation and since 1931 as Paper Makers Chemical Department of Hercules Powder Company, this pioneer in the prepared rosin size business has used the gum rosin market as a basis for computing sales prices for pale grades of rosin size.

Prior to 1951 the accepted gum rosin market was the daily "Savannah Market" based upon transactions handled through the Savannah Naval Stores Exchange. The volume of gum rosin offered through this exchange declined sharply during 1950 and 1951, and as a result it ceased to function late in 1951. Thereafter, the only published source of current market information on gum rosin has originated in the Savannah office of the U. S. Department of Agriculture. Since these reports were considered to reflect accurately the sales quantities and prices of gum rosin, Hercules adopted the weekly U. S. Department of Agriculture market as a basis for computing rosin size sales prices. This method has remained in effect until the present.

In earlier years the rosin content of Hercules' pale sizes was predominantly gum rosin and the use of the gum rosin market in establishing size prices was logical. Later, as Hercules' wood rosin (Pexite) became more readily available, the company took advantage of its outstanding quality features by using it in steadily increasing quantities as a replacement for gum rosin in pale sizes. In 1956 Hercules developed a greatly improved grade of distilled tall oil rosin (Pamite) and because of the immediate and general mill acceptance of sizes based upon this rosin, the shift away from gum rosin gained momentum. During the past year the trend toward manufactured rosins such as Pexite and Pamite has continued and today the quantity of gum rosin used in Hercules' pale sizes is a relatively small percentage of the total.

In consideration of these developments Hercules has adopted a "flat price" policy, believing that the use of the gum rosin market is no longer justified. The new program will become effective January 1, 1958. Approximately two weeks prior to that date, the company will announce prices for all grades of pale size and these prices will remain in effect through the first quarter of 1958. This same procedure will be repeated for each calendar quarter thereafter.

Consumers have long expressed strong preference for stable prices which do not reflect the usual weekly fluctuations of the gum rosin market and will, we believe, welcome this change in pricing policy.

Paper Makers Chemical Department

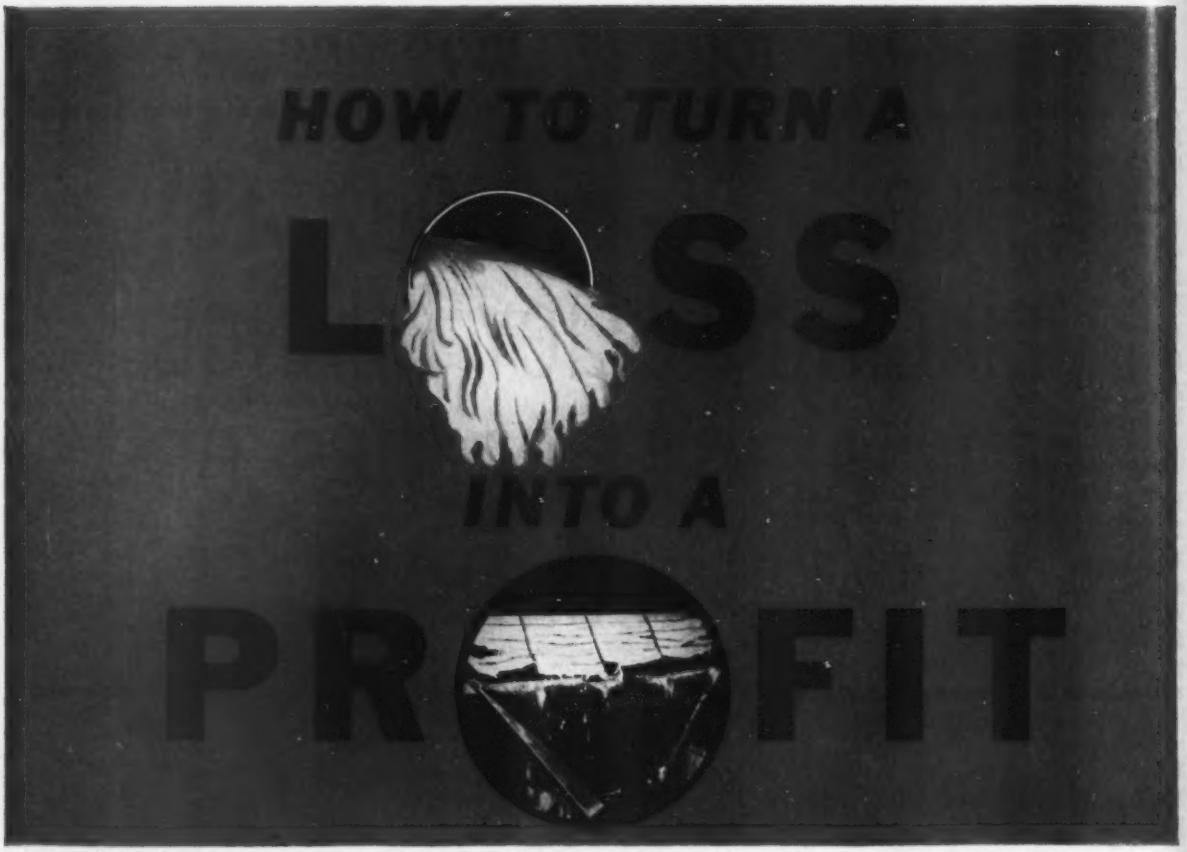
HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

PP57-7

HERCULES



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CURRENT COMMENTS

Turning the corner . . . urge to merge . . . battle lines

by WARREN B. BULLOCK

A comparison of the financial reports of paper companies for the first nine months of the year seems to justify the statement made by President Roy Ferguson of St. Regis Paper Co. that the paper industry "turned the corner" in August after a discouraging first half. Many of the company reports for the September quarter indicated a slight but definite improvement over the average for the first three quarters.

Prospects for the future are brighter according to various industry leaders. Mr. Ferguson in talking to the New York Society of Security Analysts said that a lag in business began a year ago, but that the upward trend started in August. A similar trend toward the better was indicated in a talk by David L. Luke Jr., president of West Virginia Pulp & Paper Co., when he told 1000 purchasing agents at a southeastern group conference that about 5,000,000 tons of projected annual capacity had been either scrapped or postponed. Even so, he said, additions to capacity already under construction will keep the industry slightly ahead of demand until 1960. With this near-balance between capacity and demand, the price situation should be encouraging.

Favor from Wall Street

A survey of major industries indicates that paper industry income has lagged behind the national average as compared with a year ago. However, stock market interests appear to be looking with more favor on paper mill securities as they anticipate a favorable turn in business. Economists differ somewhat as to the future. Some think the present level of activity will continue until the middle of 1958, while others believe that the tide is already on the rise.

The prevailing urge among paper companies to improve their coverage of the field by mergers for better integration of production and markets is continuing. That of Diamond Match and Gardner, already an accomplished fact, into Diamond Gardner Corp. has been followed by the conclusion of negotiations for the absorption of Marathon Corp. into American Can Co.— a step that has been agreed upon by the directorates of the two companies subject to expected approval at stockholders' meetings. Interstate Bag Co. of Walden, N. Y., is being taken over as a wholly owned subsidiary of Albemarle Paper Mfg. Co. of Virginia. Scott Paper Co. has acquired a 17-per cent interest in Joa Co. of Lake Wales, Fla., maker of sanitary paper napkins, with a supplementary agreement looking toward the company's becoming a wholly owned subsidiary of Scott in the near future.

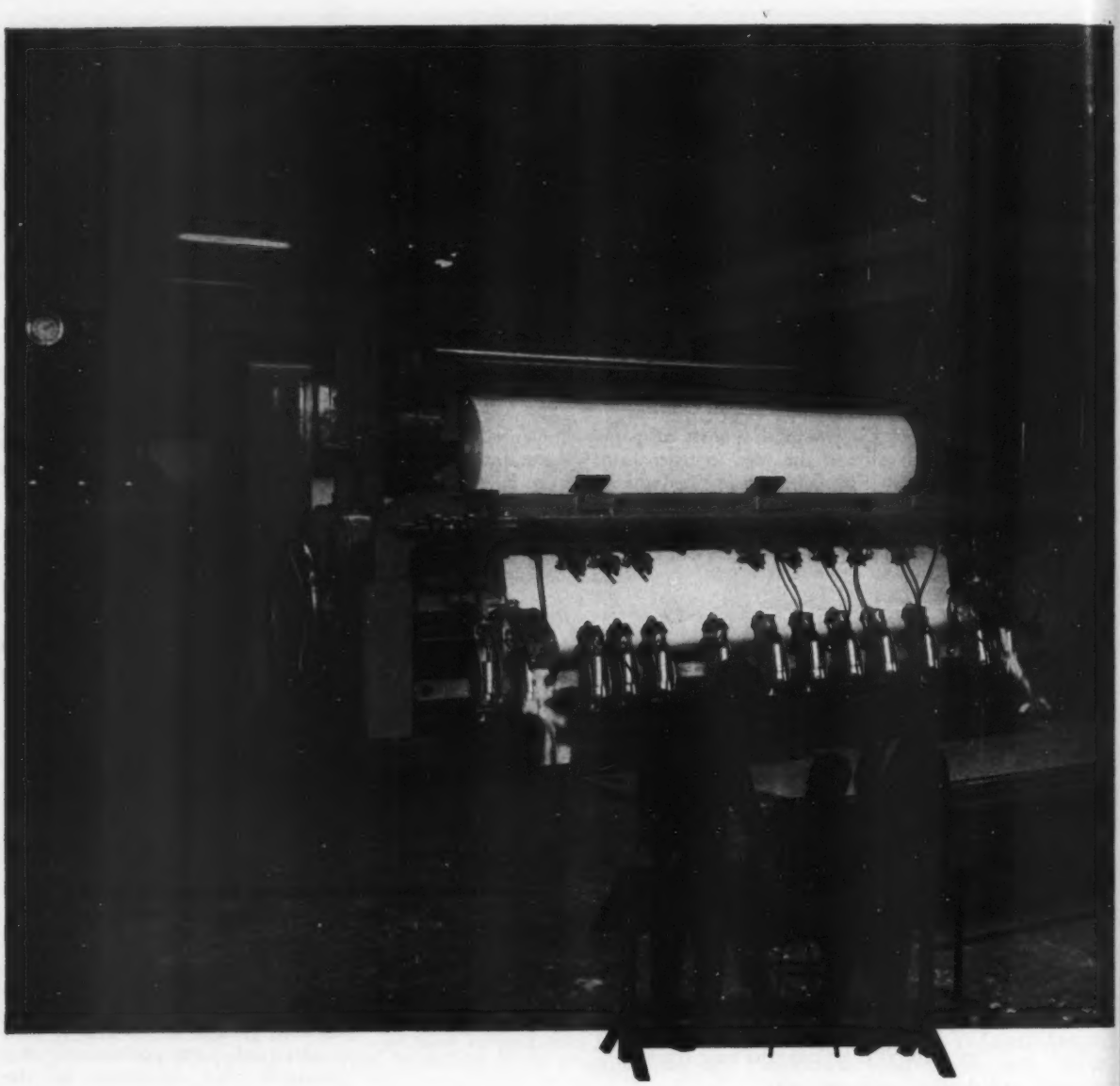
A trend reversal

A unique development, however, is that of West Virginia Pulp & Paper Co.'s entry into the paper bag field with the production of a stretchable grocery bag. As part of this program, West Virginia is to acquire Virginia Folding Box Co. of Richmond, on the basis of 155,000 shares of West Virginia common for all of the Virginia box company's stock. West Virginia is reported to have entered into an agreement with Cluett-Peabody & Co. Inc. for the use in paper of the shirt company's Sanforizing process. This is a reversal of the Kimberly-Clark proposal to make clothing of paper, with West Virginia using clothing technique in the making of paper bags.

The "urge to merge" which has been apparent in recent years in the management end of the paper industry appears to be in evidence within the industry's trade associations. In an earlier day one association comprised all phases of the wrapping paper industry. Something of the same character was found in the printing paper field. Under NRA a number of new associations were established, each covering a limited field of production, such as kraft, sulfite glassine and vegetable parchment associations in the wrapping paper area and the groundwood and book associations in the printing paper field. Today an important merger of related groups has been the combining of the Book Paper Manufacturers Association and the Groundwood Paper Manufacturers Associations into the Printing Paper Manufacturing Association, admirably constituted to cover the problems of the whole printing paper group while allowing free scope for individual attention to specialized sub-fields.

The Sulphite Paper Manufacturers Association and the Kraft Paper Association held a joint conference on mutual problems early in October. While this conference was merely an effort to avoid conflicts between groups, it was exactly such a series of joint conferences that presaged the formation of the Printing Paper Manufacturing Association.

Japanese interests have completed negotiations for the building of a $55,000,000 pulp mill in Alaska. The new mill, to be known as Alaska Lumber & Pulp Co., will be financed in part by the placement of first mortgage bonds to a total of $12,000,000 with Equitable Life Insurance Co. and General Electric Co.'s pension fund. Tadao Sasayama, president of the company, expects to raise $26,500,000 through stock sales and borrowing in Japan. An additional $7,000,000 is to be raised by the sale of senior notes in the United States. For many years the United States Forest Service strove in vain to enlist the interest of American paper manufacturers in the utilization of Alaskan forests, but none seemed to consider the en-



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KNOWING AND FILLING
THE NEEDS OF THE PAPER INDUSTRY

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Current Comments . . .

terprise a profitable undertaking. Now, however, the Forest Service has sold its idea to the Orientals.

Exports up, Imports down

Lawson P. Turcotte, president of Puget Sound Pulp & Timber Co., a recognized authority in the field of economics as applied to the paper industry, says that the domestic industry in the first nine months of the year produced 16,321,000 tons of pulp, about 2 per cent less than the record set for the first nine months of 1956. Indicated consumption was 3 per cent under the 1956 figure. Meanwhile, exports of American pulp rose to 465,000 tons from the previous year's nine-month total of 393,000 tons, while imports dropped from 1,750,000 tons to 1,600,000 tons. Scandinavia is no longer the dominant factor in the United States pulp market, and its strength is steadily waning.

Battle lines are being drawn for the conflict between American free traders and protectionists in the next session of Congress. The protectionists are asking for a change in the application of the "escape clause" provision of the Reciprocal Trade Agreement Act, particularly to require the president to accept the verdict of the Tariff Commission on proposals to change the rates of duty on imported merchandise, pointing out that under the present program the president has consistently overruled the findings of his official tariff experts. On the other hand, free trade elements are asking for a liberalization of the present program to prevent the use of the "escape clause" principle to secure added protection for domestic industries. The coming Congress will be asked to extend the present act and to authorize further duty rate reductions. The American paper industry has never been a participant in the activities of the protectionist groups.

Net incomes

Allied Paper Corp.—For nine months to September 30, $796,393; a year ago, $3,291,395.

American Writing Paper Corp.—For nine months, $477,295; a year ago, $561,895.

Bergstrom Paper Co.—For first three quarters, $719,452; a year ago, $391,167.

Certain-Teed Products Corp.—For nine months ended September 30, $1,745,365; a year ago, $1,788,730.

Chesapeake Corp. of Virginia—For 40 weeks ended October 6, $2,694,256; a year ago, $2,762,924.

Combined Locks Paper Co.—For six months ended August 1, $656,238; a year ago, $703,453.

Container Corp. of America—For nine months ended September 30, $11,439,000; a year ago, $13,994,000.

Crown Zellerbach Corp.—For nine months ended September 30, $10,125,000; a year ago, $12,468,000.

Eastern Corp.—For nine months to September 30, $913,943; a year ago, $1,273,241.

Federal Paper Board Co. Inc.—For 36 weeks ended September 7, $2,742,000; a year ago, $2,963,000.

Fibreboard Paper Products Corp.—For nine months, $3,343,704; a year ago, $4,524,587.

Fort Wayne Corrugated Paper Co.—For 40 weeks ended October 5, $536,559; a year ago, $731,832.

Fraser Companies Ltd.—For nine months, $3,652,718; a year ago, $5,156,964.

P. H. Glatfelter Co.—For nine months to September 30, $1,565,712; a year ago, $1,671,104.

Hammermill Paper Co.—For 39 weeks ended September 29, $1,563,208; a year ago, $3,009,089.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Nov. 11, 1957	Oct. 19, 1957
Celotex	26	26¾
Same Pref.	16⅛	16¾
Certain-Teed	8⅝	8½
Champion P & F	34½	33⅝
Same Pref.	*88-89¾	*90-91
Chesapeake Corp.	*23⅜-24	*41½-24¾
Container Corp.	16⅜	17⅝
Same Pref.	*82-85	*85-86½
Crown Zellerbach	43¾	45
Same Pref.	86¼	87¼
Eastern Corp.	18¼	20
Federal Paper Board	32	33⅜
Same Pref.	*19-19⅛	18½
Fiber Paperboard	22¾	22¼
Same Pref.	*80½-81	90½
Great Northern	43½	51⅞
Hammermill	23	24½
International	86¼	86¼
Same Pref.	*85-86¼	85½
Kimberly-Clark	44	43¾
MacAndrews & Forbes	25¼	*27¼-28
Marathon	28	28¼
Masonite	25	26
Mead Corp.	33⅛	36
Same Pref.	*82-84	*84-85½
Minnesota & Ontario	23¼	25⅝
Oxford	24⅜	30½
Same Pref	88	88
Rayonier	14⅞	16⅞
Riegel	*20¾-21¼	—
St. Regis	27	26½
Same Pref	*86-89	*86-88
Sealright	24⅛	24
Scott	53	54⅛
Same $3.40 Pref.	*71¼-73½	*73-75
Same $4 Pref.	*87-88½	86
Sutherland	29¼	30
Union Bag-Camp	30	29⅛
United Board & Carton	*18¾-19¾	19¾
United Wallpaper	6¾	7¼
Same Pref.	*13⅜-15	*13¾-15
U. S. Gypsum	65⅝	59¾
Same Pref.	151-156	*152-156
West Virginia P. & P.	33¼	34
Same Pref.	92⅝	94

New York Stock Exchange — Bonds

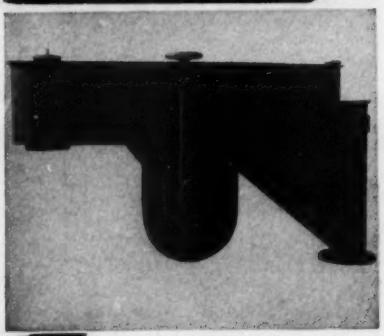
A.P.W. Products 5%	76	—
Champion P. & F. 3¼%	93½	—
Champion P. & F. 3%	95½	
Mead 3%	—	—
Scott 3%	91	89½

American Stock Exchange — Stocks

Allied	6	8⅜
American Writing	19	20
Brown	11	12½
Puget Sound	13⅞	14⅜

*Closing Bid and Asked Prices.

POIRIER
Counterflow



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Poirier's Counterflow Regulator is guaranteed to prevent basis weight variation regardless of incoming consistency.

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* May be applied from knotters to paper machine.
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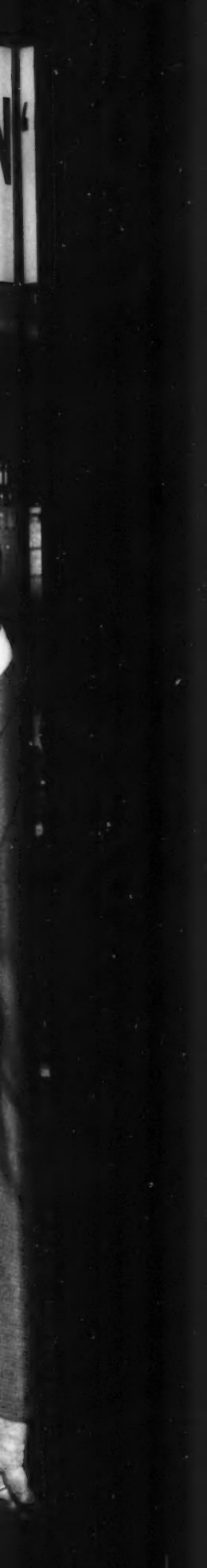
HUYCK MAINTAINS AN

Ralph Beaumont, Huyck's Director of Chemical Research, answers a paper-maker's questions about new developments during a Huyck Felt Workshop.



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One thing you'll notice whenever you visit Huyck's: there are no "secrets" concerning the felts being made for you — including Huyck's research to make them *even better.*

You will see firsthand the results of Huyck's continuing search for new and better uses for fibers. You will be told all about the latest developments in chemical treatments and be given the answers to all of the questions you've wanted to ask about felts you use.

Huyck maintains this "open door" policy, believing it is the only way to help you produce better paper — and more of it — at lower felt cost per ton.

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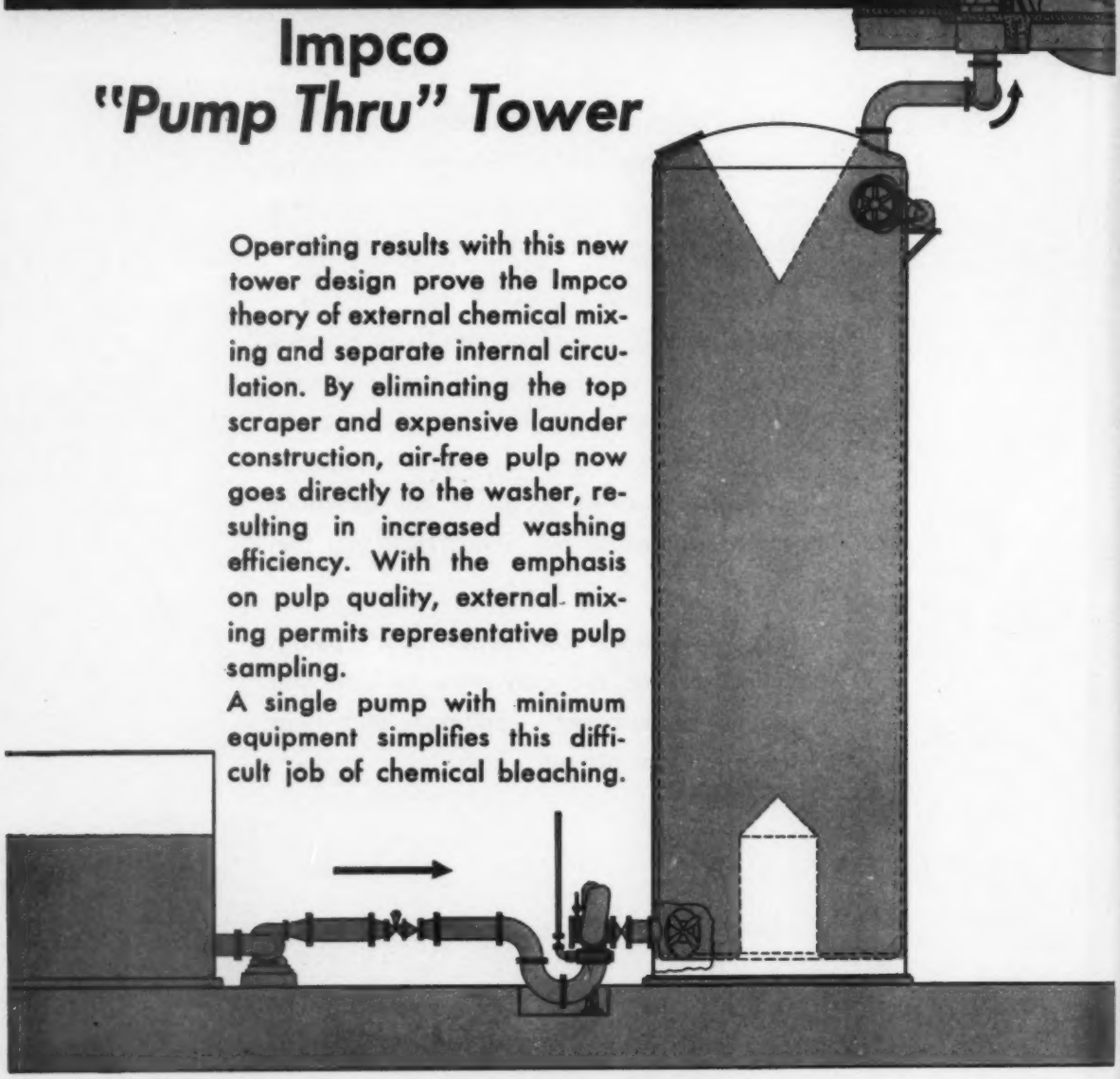
"Pump Thru" Tower

Operating results with this new tower design prove the Impco theory of external chemical mixing and separate internal circulation. By eliminating the top scraper and expensive launder construction, air-free pulp now goes directly to the washer, resulting in increased washing efficiency. With the emphasis on pulp quality, external mixing permits representative pulp sampling.

A single pump with minimum equipment simplifies this difficult job of chemical bleaching.



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NEWS of the INDUSTRY

Construction Under Way at Alaska Pulp Mill as Japanese Set Financing

Construction is under way at the $55,500,000 pulp mill of Alaska Lumber & Pulp Co. Inc. near Sitka, Alaska. It is contemplated that the 340-ton plant will be ready for operation by the end of 1959.

The firm, wholly owned subsidiary of Alaska Pulp Co. Ltd. of Tokyo, has entered into agreements for the sale of $12,000,000 first mortgage sinking fund 6 per cent bonds (Series A) due December 31, 1976. Dillon, Reed & Co. Inc. of New York, N. Y., negotiated the private sale.

This marks the first sale of securities in the United States by a Japanese-owned corporation in more than 25 years.

Alaska Pulp, the parent company, is contracting to purchase the entire pulp output of the Sitka mill and in turn will market the pulp to certain of its stockholders who are major Japanese rayon and paper manufacturers.

Only recently the final timber sale contract was reached with the United States Forest Service (U. S. Department of Agriculture). It calls for the purchase of approximately 5.25 billion board feet of timber in various areas of the Tongass National Forest.

The mill itself will produce 93-per cent alpha pulp. It will be the second mill constructed in Alaska for the manufacture of high-grade dissolving pulp, the first being Ketchikan Pulp Co. at Ketchikan. This latter plant was designed and constructed by Harold D. Gavin, who will serve a similar capacity for Alaska Lumber & Pulp.

Eastex Purchases 120-in. Southland Cylinder Unit

East Texas Pulp & Paper Co. at Evadale, Texas, has purchased a 120-in. cylinder board machine from Southland Paper Mills Inc. in Lufkin. The unit is scheduled for transfer in mid-1958 and will be out of production only one month.

The recently announced installation of a fourth newsprint machine (Pusey & Jones Corp.) at Southland will result in insufficient chemical pulp capacity to continue operation of the cylinder machine. Whereas Eastex will increase its pulp production for the purpose.

The machine was built and installed in 1918 by Moore & White Co. It was rebuilt in 1942 by Pusey & Jones. Maximum speed is 300 fpm, while the maximum trim is 110 in. Capacity is 80 tons per day.

The unit consists of the following: five 42-in. diameter by 120-in. face cylinder molds; two main presses and four baby presses; seventy 48-in. by 120-in. cylinder dryers for steam pressure of 50 psi; two eight-roll calender stacks; one Black-Clawson Co. duplex cutter; one Pusey & Jones four-drum winder, and a line shaft driven by variable speed motor.

Auxiliary equipment includes seven jordans; two savealls (6½-ft. diameter by 8-ft. face), and one broke pulper.

Improvements at Hartford City Nearing Completion

Completion of a substantial part of Hartford City Paper Co.'s $1,500,000 improvement and renovation program has been reported by the Hartford City, Ind. firm.

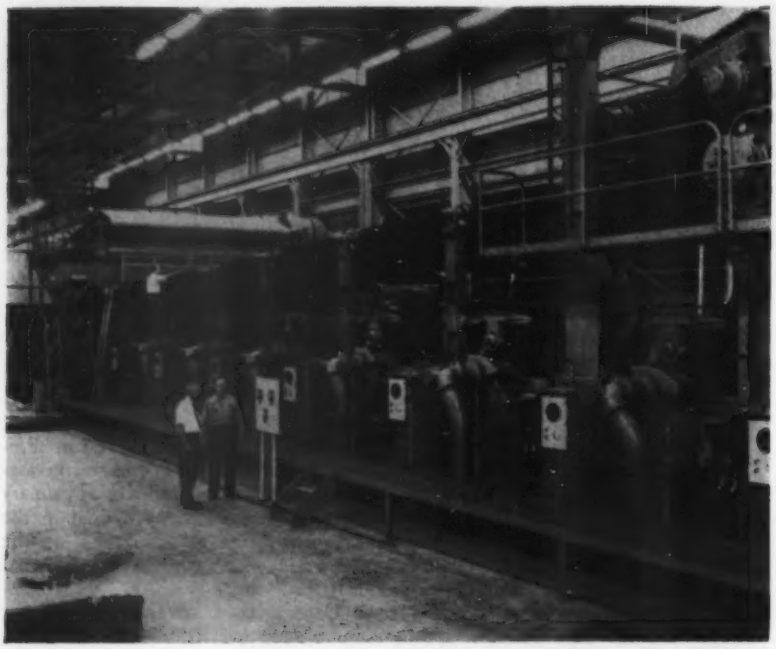
The company's third fourdrinier paper machine (a Black-Clawson Co. unit) is now operating on a full-scale production basis. And a number of other phases of the project have been completed.

When the entire program is completed sometime in 1958, Hartford City — a producer of glassine and greaseproof paper specialties — will boast greatly increased production capacity as well as high standards of quality and efficiency.

(Hartford City Paper has been a wholly owned subsidiary of Minnesota Mining & Mfg. Co. of St. Paul, Minn., since late in 1955; and in addition to producing glassine and greaseproof papers, the mill is a primary source of the basic stock used in the copying paper manufactured at the new 3M plant opened recently at Hartford City.)

Other phases, of the improvement and renovation include: complete rebuilding of the existing machine buildings; the installation of a 10-ton overhead crane; the remodeling of two paper machines; a new wet end and press section for one unit; new dryer drainage systems; a new stock preparation system for all machines — includ-

RECENTLY COMPLETED chemical recovery unit at Halifax Paper Co., Roanoke Rapids, N. C. The plant has a designed capacity of 1,500,000 lb. dry solids per 24 hours and has the relatively high design pressure of 1000 lb. with an operating pressure of 850 psig at 825F. Equipment includes superheater, economizer, stainless steel air heater, automatic sequential Diamond soot blowers, tubular evaporator, black liquor heaters, water-cooled smelt spouts and steam atomizing oil torches. The facility also contains a Graver hot lime softening plant, Zeolite softeners, a three-compartment wet-bottom electrostatic precipitator, a 15-ton pneumatic handling system, complete automatic controls and an alarm and annunciator system. Engineering and construction was by Ebasco Services Inc.



"LARGEST PAPERBOARD machine in the world" was started up recently at Whippany Paperboard Co. in Whippany, N. J. The 234-in., eight-cylinder Beloit Iron Works giant is expected to reach speeds of 500-600 fpm on jute liner and other grades. The 60-in. cylinders are individually driven. One hundred dryers insure maximum drying capacity. The bottom felt (Albany Felt Co.) is the largest such felt ever produced, measures 287 ft. by 234 in. and weighs more than 1000 lb. Also carried are a 500-lb. top felt and a 200-lb. felt on both the second and third presses.

ing four new beaters and two new pulpers; new all-tile beater chests and machine chests; a new supercalender; completely new air systems; chlorine water treatment system, and a new reservoir adding about 2,000,000 gal. to the water reserve capacity.

Utilization the Key to Success in Northwest

Over the last decade, better utilization has characterized the growth of the pulp and paper industry in the Pacific Northwest. In that time, according to the Northwest Pulp & Paper Association, the industry has boosted pulp production by more than 50 per cent with only a 6-per cent increase in logs cut.

The answer is a seven-fold growth in the use of sawmill leftovers. A decade ago much of this wood was burned as waste.

At the same time the pulp and paper industry's use of "farmerwood" in Oregon and Washington more than doubled.

These two states produce slightly more than 3,000,000 tons of pulp annually—nearly 20 per cent of the national total. More than two-thirds of this pulp is converted to paper and paperboard in Pacific Northwest plants.

Ten years ago most of the pulpwood was delivered to the mills as logs. Today about one-half of the wood consumed consists of chips, sawmill wastes and farmerwood.

According to the association's recent survey, Oregon and Washington pulp mills spent about $116,000,000 for wood during 1956—an increase of $68,000,000 in ten years.

Allied Paper Installs New Equipment at Kalamazoo

New equipment installations at the Kalamazoo, Mich. mills of Allied Paper Corp. reflect a major step in the firm's continuing program to improve product quality and operating efficiency.

Four-stage slide washers have replaced the former three-stage units in the pulp mill at the King plant. An improved screening process has been instituted, with flat screens replaced by high-frequency vibratory type screens. And equipment has been installed for a continuous pulping process, along with new consistency regulators and flow meters.

Similar screens were installed in the Bryant mill, which already uses a continuous pulping process.

New felt conditioners are going in at both King and Bryant to carry a cleaner wet paper to the dryers. A high-accuracy trimmer unit has been added at King, two such units having previously been installed at Bryant. New oscillating devices have been added to the rewinders.

Longview Fibre Operates Largest Recovery Unit

Longview Fibre Co. of Longview, Wash., has placed in service the world's largest chemical recovery unit. Designed and built by Combustion Engineering Inc., it has the capacity to burn 2,000,000 lb. dry solids per day, and to generate approximately 300,000 lb. steam per hour.

Eight similar but smaller units of this new design are already in service in various parts of the United States, Canada and Finland.

The power plant at Longview has an installed capacity of 45,000 kw. A 350,000-lb. per hour Combustion Engineering boiler was recently added to the plant, which also includes CE recovery units installed in 1947 and 1952. The earlier units had respective dry solids capacities of 600,000 and 1,050,000 lb. per day.

Western Michigan to Offer Sales Training

Paper Sales, a third opportunity for specialization within the paper technology department, will be offered in the fall of 1958 at Western Michigan University in Kalamazoo.

The program is sponsored by the Salesmen's Association of the Paper Industry. The curriculum includes studies in paper technology and 12 other academic departments of the university: economics, business, basic studies, chemistry, physics, speech, physical education and political science.

Marathon Consolidates Sales and Manufacturing

A long-range program consolidating Marathon Corp.'s sales and manufacturing functions under single management heads was completed recently. Four new operating divisions were created and executive responsibilities realigned.

In this move toward decentralization, the existing central marketing and manufacturing divisions have been dissolved. And personnel assigned to these areas have been transferred to the new operating di-

visions and to new central staff units organized to provide specialized services.

Leo E. Croy, formerly head of the marketing division, has been elected senior vice president. He is aiding in the development of the new profit center concept of organization and devotes time to future planning and development.

Over-all operations are directed by Roy J. Sund, former head of the manufacturing division, who has been elected executive vice president.

One new operating division is responsible for the production and sale of Northern household products and is headed by Milan Boex, vice president in charge of the former Northern Sales Div. Included are production facilities at Green Bay, Wis., and Menominee, Mich.

Frozen food, dairy and meat packaging operations are directed by Donald A. Snyder, former vice president in charge of food packaging sales. Plants under his jurisdiction are two at Menasha, Wis.; at Modesto, Cal.; Sunnyside, Wash.; Newnan, Ga., and Oswego, N. Y.

A new pulp and paper division is headed by Russell C. Flom. He was formerly director of pulp, paper and paperboard sales. This area includes production facilities at Rothschild, Wis.; the Oswego paperboard mill, plus the operations of Marathon Corp. of Canada Ltd. Also included will be the pulp and paper plant now under construction at Naheola, Ala.

Stock products and bakery packaging activities are directed by Palmer B. McConnell, former stock products sales manager. Plants at one Menasha location and at Ashland, Wausau and Neenah are assigned to the division, as well as paper cup production at Chicago.

Saskatchewan Mill Plans Indefinite

Plans for a projected $60,000,000 pulp mill near Prince Albert, Sask., were expected to be clarified at a recent meeting in Regina between officials of Waskesui Forest Products Ltd. and the provincial treasurer.

Construction was scheduled to have begun last fall but was postponed reportedly because of unfavorable market conditions. Option on 5400 sq. mi. of timber limits expired September 1.

The mill as planned would have a daily capacity of 600 tons of bleached and unbleached kraft, all of which would be exported to the United States. Equipment modifications would make possible the eventual production of newsprint.

Estimates put the cost of the mill itself at $32,000,000, while another $28,000,000 is earmarked for a system of all-weather roads and railway lines.

THE LARGEST CONTINUOUS digester in the United States went into production in September as Gulf States Paper Corp. opened its new pulp mill at Demopolis, Ala. A 300-ton per day Kamyr digester is the heart of the new plant, which cost approximately $20,000,000. Above is shown the covered conveyor that transports chips from the preparation stage to the digester (right). In the left foreground is the lime storage bin.

Construction on Schedule at Georgia-Pacific Paper

Construction of the Toledo, Ore. mill of Georgia-Pacific Paper Co. is on schedule, according to President H. Stuart Daniels. The pulp and paper plant will have a daily capacity of 250 tons of kraft paper and linerboard and is set for production early in 1958.

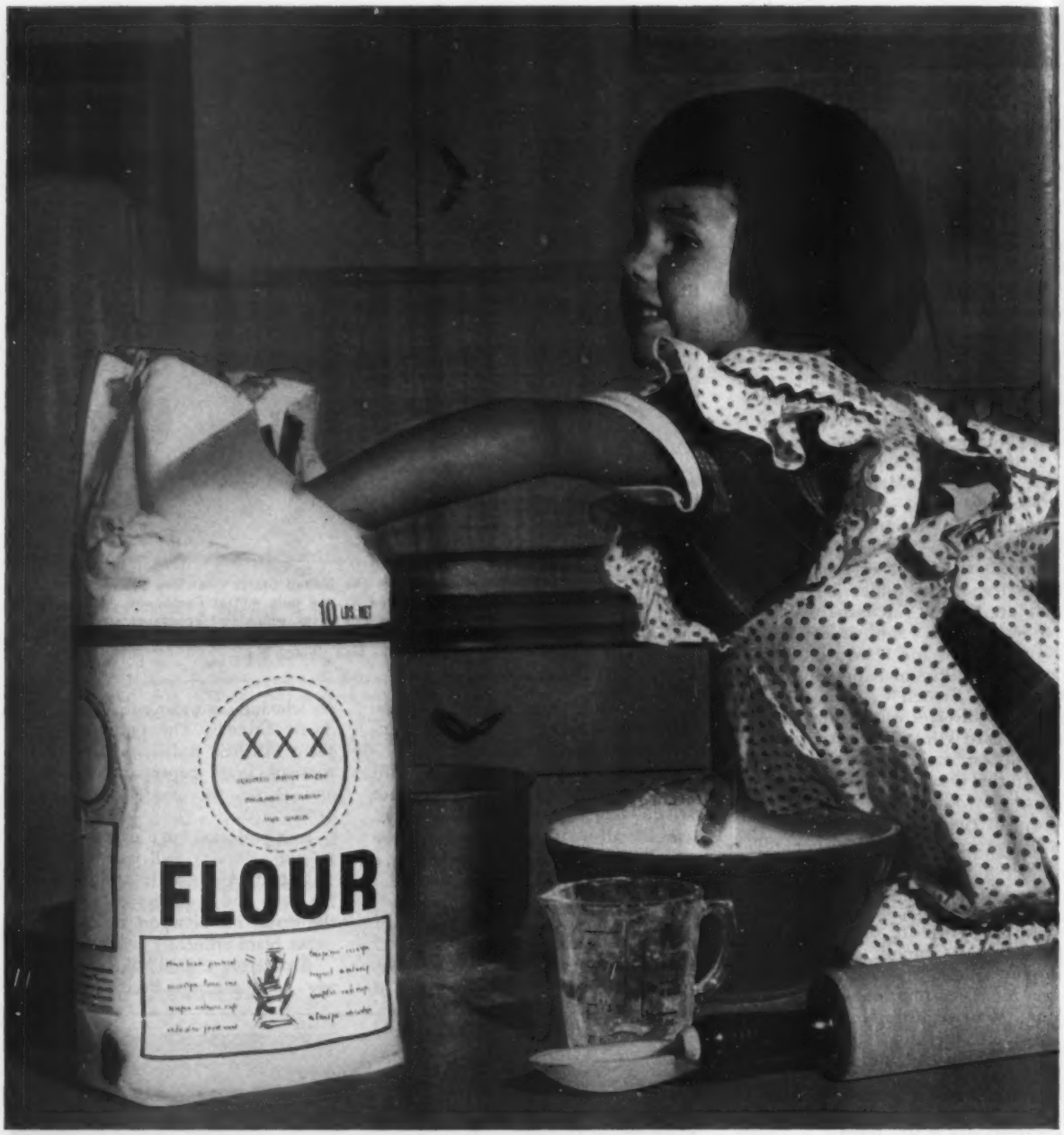
Anti-pollution measures alone (water and air) will cost more than $750,000. A 7½-mile 16-in. pipeline has been laid a quarter of a mile into the ocean off Newport to carry away paper plant effluent.

Around its 42,000-bbl. fuel oil storage tank Georgia-Pacific has con-

THE NEW tug "William L" recently constructed at Atlantic Beach, Fla., for the Mill Div. of Owens-Illinois Glass Co. Her two 600-hp engines will enable her to replace three older tugs in towing barge-loads of timber from the Bahama Islands to a rendezvous point off Grand Bahama Island, where the larger tug "Linden" will take over for the trip to Jacksonville.

Some 300,000 acres leased from the British Government in the Bahamas are being logged to supplement the timber resources of O-I in this country. Pulpwood thus cut is converted to paperboard at the big O-I mill in Jacksonville.

The 65-ft. "William L" honors William E. Levis, O-I board member and former president and board chairman.



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structed a deep earth dike as protection against any possible contamination of the bay by leakage.

A water barrier on Ollalie Creek has been finished, shutting off salt tide waters that would be harmful to the plant's water supply. Five miles upstream work has been completed on an earth fill dam that will impound water to supplement the supply for plant operation during low-water periods.

At the plant site itself an electrostatic precipitator will be used to collect even the finest chemical particles. A 120-ft. stack will carry gases away from the recovery furnace, largely deodorized; and a Peabody gas scrubber, in combination with an intermediate scrubber, will eliminate all lime dust discharge.

Digesters, brown stock washers, evaporators, liquor storage and chemical recovery tanks are in place, the paper machine and the boilers are presently under erection, and chip and pulp conveyor systems are installed. Sixty-four dryer rolls 5 ft. in diameter and 22 ft. long are being set in place.

Major equipment suppliers include: Allis-Chalmers Mfg. Co.; Bailey Meter Co.; Black-Clawson Co.; James Brinkley Co.; Chain Belt Co.; Chemical Linings Inc.; Combustion Engineering Inc.; DeZurik Corp.; Dorr-Oliver Inc.; Electric Steel Foundry Co.; Fairbanks, Morse & Co.; Farrel-Birmingham Co. Inc.; Foxboro Co.; Fuller Co.; General Electric Co.; Goulds Pumps Inc.; Graver Water Conditioning Co.; Grinnell Co.; E. D. Jones & Sons Co.; Lamb-Grays Harbor Co. Inc.; Link-Belt Co.; Nash Engineering Co.; Rosenblad Corp.; J. O. Ross Engineering Corp.; Taylor Instrument Companies; Trane Co.; Valley Iron Works, and Worthington Corp.

Kimberly-Clark Buys Into Canadian Mill

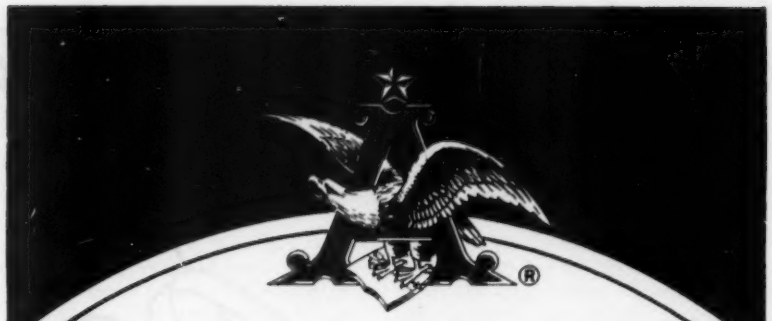
Kimberly-Clark Corp. of Neenah, Wis., has purchased a 35-per cent interest in Irving Pulp & Paper Ltd. of Lancaster, N. B.

The Canadian firm operates a sulfite pulp mill, sawmill facilities and considerable timberlands. A sulfate pulp mill is under construction.

It was reported that the purchase price was $8,400,000 in Canadian funds.

K-C will buy some pulp from the New Brunswick mill and will also provide technical assistance.

(Turn to page 818)



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NAMES in the NEWS

Robert O'Connor Named APPA Executive Secretary

The executive committee and board of governors of the American Paper & Pulp Association has named Robert E. O'Connor to the post of executive secretary. He succeeds the late Earl W. Tinker, who died August 13 while on vacation.

O'Connor, for the past 3½ years assistant executive secretary, has been with the APPA since 1947. He joined the staff as member of the industrial relations department and subsequently served as secretary of a number of committees concerned with a wide variety of industry interests.

James McClure

E. J. Gilman

Allied Paper Changes

Allied Paper Corp. has reported new appointments in key executive positions:

James McClure, formerly with W. C. Ritchie & Co., has been named vice president in charge of manufacturing. E. J. Gilman shifts from manufacturing vice president to vice president for administration.

Special duties in connection with mill problems have been assigned to Harley Nelson, who was formerly associated with French Paper Co. and has 20 years' technical experience in the production of paper.

St. Regis Changes

George J. Kneeland, production coordinator since 1954, has been elected assistant vice president of St. Regis Paper Co. and will serve as assistant to Benton R. Cancell, executive vice president. Kneeland will continue as production coordinator.

Walter H. Pollard, who has been serving as an independent consultant, has joined the St. Regis staff in a similar capacity and will serve as an assistant to Cancell.

John A. McDermott, supervisor of all paper mills, is now general manager of all pulp and paper manufacturing. He joined the firm in 1928.

U. J. Westbrook, supervisor of all pulp mills, is now manager of kraft pulp and paper manufacturing. He became associated with St. Regis in 1941 at Pensacola, Fla., and later served as general superintendent there and as southern division production manager.

Cousins Retires at Scott

Dennis E. Cousins, vice president of Scott Paper Co. for the past three years, has retired after a 38-year career in the paper industry. He was an executive with Hollingsworth & Whitney Co. for 19 years before that company was merged with Scott in 1954.

Cousins was named plant manager for H&W at the Mobile, Ala. mill in 1938 after supervising its construction. In 1950 he was elected a vice president and was made a director in 1953. In that year he moved to the Boston headquarters to become head of all manufacturing operations.

As a vice president of Scott, Cousins has been assigned to Mobile to direct the firm's multimillion-dollar development program.

Glenn Stevens

William Arvold

Wausau Changes

Wausau Paper Mills Co. has revealed a realignment of executive responsibility at the Brokaw, Wis. headquarters.

Glenn Stevens, secretary-treasurer since 1948, becomes executive vice president; William V. Arvold from technical director to the new office of mill manager; Otto Kuemmerling from general superintendent to production manager, and Frank Strout from cost analyst to treasurer.

Other new assignments: Robert Howard, technical assistant, named technical director, and Paul Schultz Jr. from office manager to assistant secretary-treasurer.

Hammermill Appointments

Karl E. Vogel, former technical coordinator in charge of pulp mill development and expansion projects, has been named assistant pulp mill superintendent at Hammermill Paper Co., Erie, Pa. At the same time Merlin J. Smith, maintenance engineer in the maintenance division, was made assistant maintenance superintendent.

In the paper mill Lloyd Fuller was promoted from backtender to paper mill supervisor. He is a 12-year veteran at the Erie mill.

Mahler Retires as Board Chairman at Institute

Ernst Mahler has retired after 28 years as chairman of the board of trustees of the Institute of Paper Chemistry, Appleton, Wis. He was named honorary chairman at the board's recent annual meeting in Chicago.

W. Irving Osborne Jr., board chairman of Cornell Paperboard Products Co., succeeds Mahler as chairman; while David L. Luke, president of West Virginia Pulp & Paper Co., becomes vice chairman.

Reelected as officers of the Institute were: John G. Strange, president and treasurer; Harry F. Lewis, vice president, and Wendall H. Smith, secretary.

Westvaco Promotes Thompson

William M. Thompson, general superintendent, has been promoted to the position of assistant manager in charge of production at the Luke, Md. mill of West Virginia Pulp & Paper Co. He succeeds the recently retired Frank A. Borges and will be responsible for the direction of pro-

For Longer Service

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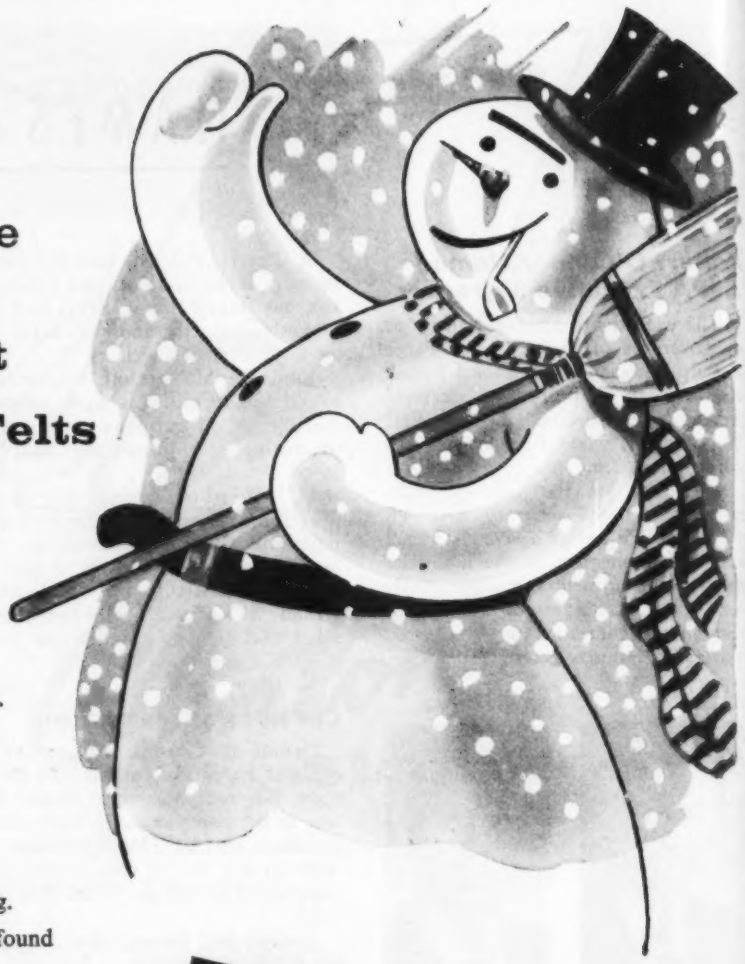

While the weather's cold,
this jolly snowman looks as though
he'll be greeting passers-by all winter.
But appearances are deceiving . . .
for, on the first mild day
he'll melt away.

In buying felts, too,
physical appearances can be deceiving.
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Names in the News . . .

duction, engineering, construction and technical service activities.

Thompson joined the firm in 1945 as a chemical engineer in the research department. He was at one time associated with the Petrochemical Development Div. of Celanese Corp. of America.

Borges had been assistant manager in charge of production at Luke since 1953. He became associated with West Virginia Pulp & Paper in the engineering department at Luke in 1919.

N. H. Anderson, purchasing agent, has been promoted to the post of assistant to the mill manager for Longview Fibre Co. at Longview, Wash. Anderson, who joined the firm in 1947 as an engineering draftsman, will supervise purchasing and the Paper Order Department. **L. C. King,** formerly assistant purchasing agent, moves up to succeed Anderson.

N. H. Anderson

J. W. McNichol

John W. McNichol has been appointed general manager of the Southern Div. of Scott Paper Co. at Mobile, Ala. He joined the firm in 1939 as a supervisor, was made superintendent of finishing in 1943. He subsequently became plant manager and in 1956 was made executive assistant to Vice President **Dennis E. Cousins,** who has recently retired.

Russell Elston, a chemical engineer at the Nekoosa, Wis. mill since May 1956, has been named technical assistant to the resident manager of Nekoosa-Edwards Paper Co.'s recently acquired mill in Potsdam, N. Y.

Adm. Arthur W. Radford, who recently retired as chairman of the joint chiefs of staff and as senior advisor to both the president and the secretary of defense, has joined

(Continued on page 820)

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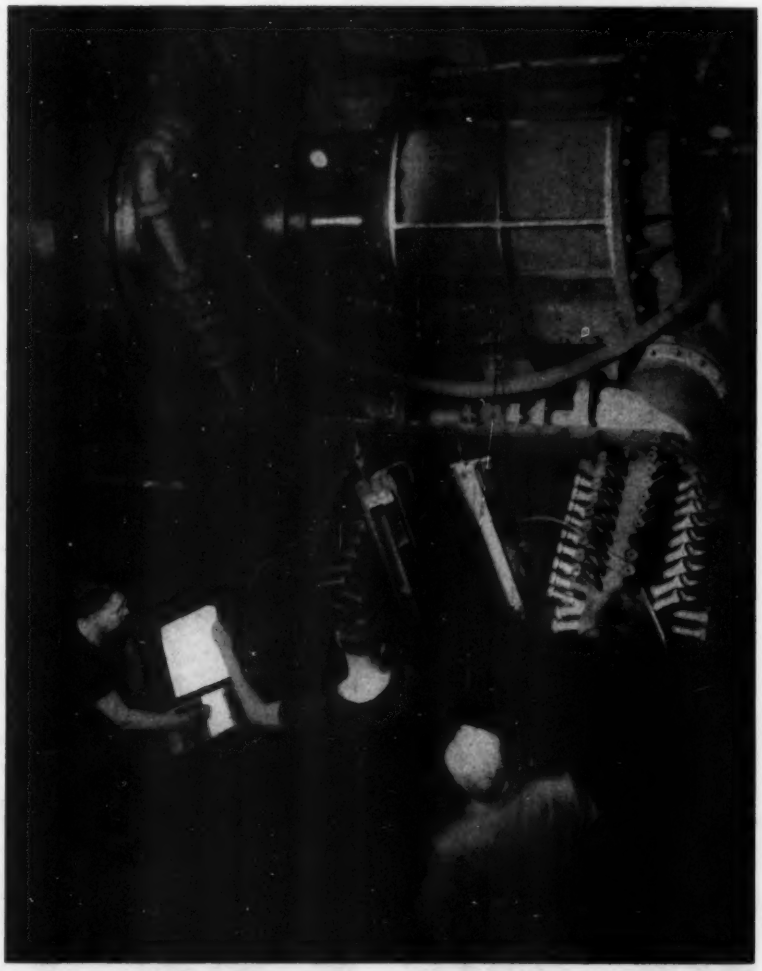

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FOREIGN ABSTRACTS

Fig. 1

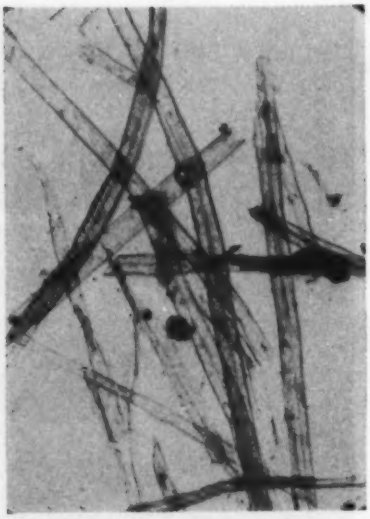

Fig. 2

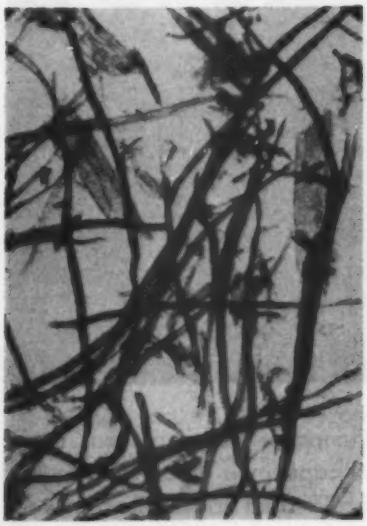

Fig. 3

Fig. 4

Differentiation between semi-chemical and chemigroundwood pulps

In the past there has been no difficulty in distinguishing between mechanical pulp and various unbleached chemical pulps. However, differentiation between semi-chemical pulps and mildly pretreated chemi-groundwood pulps is more difficult. Here, neither chemical analysis nor microscopic staining reactions have proved adequate. When bolts of wood are given a chemical pretreatment and are then ground, long fibrils are usually formed which can be seen microscopically. These are not formed in neutral semichemical sulfite pulps and serve to distinguish the two products.

Fig. 1 shows a fibrillated spruce chemi-groundwood prepared in 88 per cent yield by the Libby-O'Neil process. Fig. 2 shows the non-fibrillated pulp obtained in 71 per cent yield from spruce by a neutral semi-chemical sulfite digestion. Fig. 3 shows a white groundwood formed in 99 per cent yield from poplar, indicating torn fibers and marked fibrillation. Fig. 4 shows a neutral semichemical sulfite pulp made from poplar in 74 per cent yield, which shows no appreciable fibrillation. Even in the case of birch semichemical pulps, in which many fibers are fragmented, long fibrils are *not* formed. When green wood chips are ground by the Bauer method (cf. Eberhardt, *Tappi*, 39, No. 7, 126A, 1956) fibrillation does not occur. Hence, another problem may arise when attempts are made to show differences between this pulp and that prepared by the neutral sulfite semi-chemical process.

Twelve photomicrographs are included. Fritz Neumann and Kläre Herb. *Das Papier*, 11, 391-8 (1957) (in German).

High-temperature semichemical pulping of mixed species

With a view towards determining whether neutral semichemical sulfite pulps from mixtures of hardwoods and spruce might find further application in the industry, the Pulp and Paper Institute of Heidenau made a study of the pulping of two-component wood mixtures.

The hardwoods used were birch, beech and aspen. The softwood was spruce. Thus six series of cooks were made with varying amounts of each wood; beech-spruce; birch-spruce; aspen-spruce; beech-birch; beech-aspen and aspen-birch. The mixtures contained 20, 40, 60 and 80 per cent of either component, and cooks were also made with each wood alone.

Altogether, 28 pulps were obtained. The cooks were made with 12 per cent neutral sodium sulfite and 5-6 per cent sodium carbonate (based on the dry wood). The entire cooking period was only 20-40 min. and the pressure was 11 atmospheres, with temperature maxima of 200-240°C. Pulps were analyzed for ash (which varied only from 1.0-1.5 per cent), lignin, furfural-yielding material (calculated as furfural) and the pH of the spent liquor. The lignin varied from 12 per cent for poplar to 24 per cent for spruce. Physical constants like breaking length, burst, density, folding endurance and the so-called "degree of pulping" (actually a permanganate number given in terms of cc. 0.1*N* $KMnO_4$ per gram of pulp) were also determined.

Although the degree of cooking varied widely, the variations were predictable from the nature of the woods used. The pulps resulting from the two-component mixtures of the hardwoods showed relatively slight variations, whereas the addition of sprucewood caused a marked increase in this "degree of cooking": i.e. the lignin content was higher. The pulp yields varied from 73.6 to 84.5 per cent without special trend. Breaking lengths varied from 4090 to 8730 meters at 50°S.R. By mixing poplar or beech with sprucewood, pulps

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Foreign Abstracts . . .

were obtained that were actually poorer in breaking lengths that were those of the hardwood pulps alone; spruce and beechwood mixtures gave pulps showing an improvement in tensile strength over that of beechwood pulp. This pulp showed very poor folding endurance which was greatly improved by admixture with any of the other woods. Whenever beech was mixed with any one of the other species the strength properties decreased significantly. Inasmuch as these cooks were all of short duration at high temperatures, the results have a bearing on the trends that may be expected in continuous semichemical digestions.

Three tables and five graphs are included. W. Riese *Zellstoff u Papier* 6, 145-8 (1957) (in German).

Sulfite pulp from African eucalypts

A eucalyptus wood grown in the Union of South Africa could be pulped satisfactorily by the sulfite process. However, the wood was not identified botanically. Since there are several hundred eucalyptus species, a sharp warning is issued regarding any generalizations concerning the sulfite pulping of eucalyptus wood. The density of the wood was 0.677 g/cc and pulping was effected more rapidly than with spruce. When the degree of pulping (as indicated by the Björkman number) was the same for either spruce or eucalyptus, pulp yields from the latter were slightly lower than those from the former.

However in either case, when precautions were taken to protect the easily-hydrolyzable hemicelluloses in the eucalypts, the yields were about 49-59 per cent unbleached pulp. The higher density of the hardwood permitted a greater actual weight of wood chips to be used in a digester charge than with spruce. Hence, for a specific digester volume the yields of pulp from the eucalyptus were actually higher than were those from spruce. A one-stage bleach with hypochlorite or with chlorine dioxide gave eucalyptus bleached pulp yields of 45-51 per cent with brightness values of 90-92 per cent. The strength properties of such pulps were inferior to those of spruce sulfite; this was especially true in the case of burst and folding endurances.

H. Sadler and O. Trantina. *Holzforschung u Holzverwertung*, 9, No. 3, 37-45 (1957); through *Das Papier* 11, L91 (1957) (both in German).

Fiber bonding in nylon paper sheets

The paper sheets made from certain synthetic fibers are of interest because of their strength properties; their resistance to water, heat, and to chemicals; their possible use in packaging, and their application as filters for corrosive liquids and fumes. In their manufacture, certain problems arise which are not met in cellulose pulps. The synthetic fibers do not fibrillate and their interfiber bonding demands different treatments—two types of which are outlined in the present article. In the first (chemical) treatment, the chlorides and sulfates of calcium, zinc, magnesium or lithium are used in treating the fibers. This is followed by evaporation and drying so that the salt concentration on the fiber surface is suitable. The fabric is then subjected to higher temperatures and pressures. Thus the fibers swell and felting takes place.

In the second method (which gives better results but which is more expensive than the first), the fibers are impregnated with rosin emulsions or with low-melting polyamides or polyesters. In the present study, the properties of a nylon paper were examined and calcium chloride was used as the binder. Effects of various concentrations of the calcium salt solutions and of varying temperatures and pressures on paper properties were investigated. The optimum tensile strength and resistance to burst were obtained when a 4-5 per cent calcium chloride solution was used and when the treatment was given for 1-2 min. at 50 kg./sq. cm and 160°C. However, there were difficulties in obtaining a uniform sheet and the tear resistance was rather low.

Three tables, 6 figures and 5 references are included. G. Prati and S. Pacetti, *Ind. carta*, (Milan), 10, No 8/9, 93-7 (1956); through *Bull. Inst., Paper Chem.*, 28, 70-71 (1957) (original in Italian).

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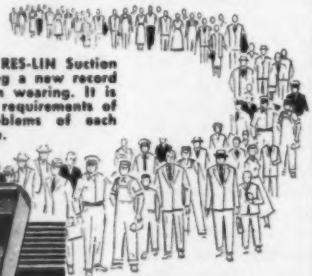

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PATENT REVIEWS

MELVIN NORD*

Anti-clogging method for circulation heating of cooking liquid for digesters

U.S. 2,801,918, issued August 6, 1957, to Erik A. Annestrand, assigned to Aktiebolaget Separator, describes an apparatus by which clogging of the heat exchanger with pulpy material from a digester is prevented.

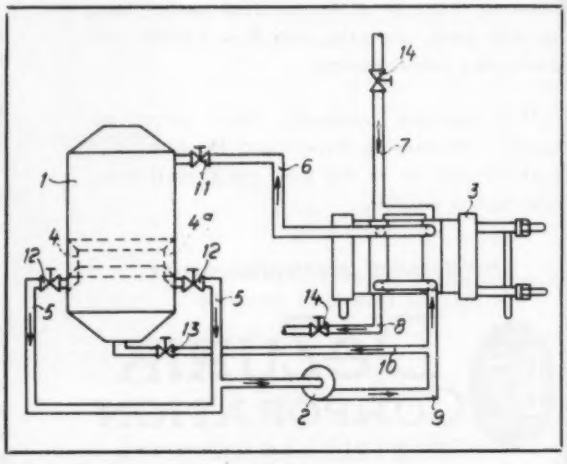

Fig. 1

Fig. 1 shows the apparatus. Before a cooking operation is started, the digester 1 is substantially filled with chips and cooking liquor, valves 11 and 13 being shut. When the cooking is started, valve 13 and the valves 12 are first opened. In this way, the cooking liquor is caused to circulate from the digester 1 through the annular sieve 4, the outlets 5, the pump 2 and the lines 9 and 10 back to the bottom of the digester. In this way, any lumps of agglomerated pulp fibers which may have been dislodged from the seive or pressed through it at the end of the preceding cooking operation are again returned to the sieve 4, instead of being carried to the heat exchanger.

When all the fiber lumps have been returned, the valve 11 is opened. The greater part of the cooking liquid is thus caused to circulate through the heat exchanger 3 and is led through line 6 back to the top of the digester 1. The valves 14 for steam and condensate are opened so as to start the heating in the heat exchanger. When the cooking is completed, valves 11 and 13 are shut off and the relief gases drawn off from the digester. The prepared pulp is then drawn off through a separate bottom outlet.

Process for treating spent sulfite liquor

U.S. 2,801,900, issued August 6, 1957, to Richard F. Benning and Martin A. Baum, assigned to Marathon Corp., describes a process for treating spent sulfite liquor for continuously removing calcium bisulfite and loosely combined sulfur dioxide.

Spent sulfite liquor is treated with 30 to 50 ppm of silica sol and is then neutralized with lime to a pH of 8.4 to 9.0. A coagulated calcium sulfite forms, which settles in 1 to 2 min. The time for settling of calcium sulfite depends on the concentration of silica sol and on the pH. The time to flocculate and settle is not further reduced by using more than 50 ppm of silica sol. Floc forms with a pH as low as 6.5, but a minimum pH of 8.4 is required to split off loosely combined sulfur dioxide and convert it to calcium sulfite. At a pH above 9.0, basic calcium lignosiulfonate is precipitated in amounts which interfere with rapid floc formation. The order in which silica sol and lime are

*Patent attorney, 17600 Pinehurst, Detroit 21.

added is also important. The preferred procedure is to add silica sol to the spent sulfite liquor first and then add lime. A flocculated calcium sulfite also results when sol is added to lime reagent and the mixture then added to spent sulfite liquor, but it is of inferior quality. The quality of floc is very poor when silica sol is added after lime has been added to the spent sulfite liquor.

The floc obtained with silica sol is friable, that is, it will break and redisperse with mechanical agitation and will then not settle rapidly. This difficulty is eliminated by an apparatus described in the patent. Silica sol-treated spent sulfite liquor and lime are mixed in a mixing zone at a rate up to 300 gpm where the floc is formed and from which zone it is rapidly removed without mechanical agitation. The reaction mixture carrying the floc then passes into a settling vessel where settling occurs. Clear liquor is removed continuously from the top of the settling vessel and calcium sulfite sludge from the bottom.

Production of embossed coated fiberboard

U.S. 2,803,188, issued August 20, 1957, to Thure C. Duvall, assigned to Wood Conversion Co., provides an improved method of embossing coated fiberboard.

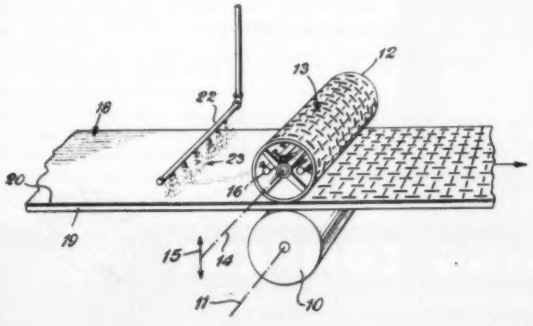

Fig. 2

In Fig. 2 the numeral 10 represents a bottom roll with a fixed axis 11. Above roll 10 is an embossing roll 12 having a pattern 13 on it. The embossing roll 12 has its axis 14 vertically movable, under the control of suitable yielding apparatus (not shown). Gas burners 16 are located within the embossing roll 12 for heating it. Numeral 18 represents an unembossed board passing between the two rolls. The board 18 has a porous fiber body 19 and a porous coat 20.

In advance of the embossing roll 12 is a water spraying device 22. When the water strikes the heated roll 12, it vaporizes to steam and the steam enters the pores of the coat 20 and the surface layer of the fiber body 19 beneath the coat. Under the influence of heat from the roll 12, and of the resulting steam, the coat is plasticized at the same time that the fibers beneath the coat are plasticized by the steam which has entered. Some of this steam will also have condensed and wetted the fibers to enhance the plasticity. Thus the coat and the surface layer of the fiber body yield readily to the embossing pressure and as the board leaves the roll the embossing becomes set as the plasticized materials cool. The residual heat in the face of the embossed board hastens the loss of residual moisture and return to moisture-equilibrium with the atmosphere.

Treatment of spent sulfite liquor

U.S. 2,802,791, issued Aug. 13, 1957, to Roy P. Whitney, Shu-Tang Han and James L. Davis, assigned to The Institute of Paper Chemistry, provides a simple, economical and commercially feasible method for handling the spent liquors from the sodium base neutral sulfite semichemical pulping process. A direct recovery method is used, in which spent liquors are regenerated through direct sulfitation, without the production of sodium thiosulfate and other polythiomic compounds.

After concentration to 55-50 per cent solids, the sulfite liquor is burned to form a smelt consisting primarily of sodium sulfide and sodium carbonate. This smelt is dissolved to produce an aqueous solution having a pH in excess of 11.0 and a sodium sulfide concentration of less than 1.2 moles per liter. This solution is treated

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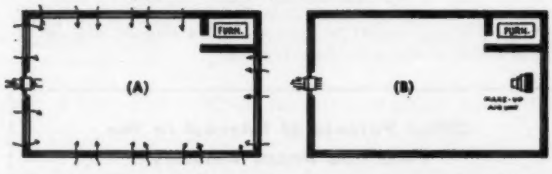

Warm air, exhausted from a machine shop area, replaced by cold air pulled through cracks and door openings (A). Filtered and tempered air, supplied by Air Make-Up Unit installed in same area (B) helps to maintain constant temperatures; levels-off "peaks" and "valleys" in boiler or furnace loading.

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Patent Reviews . . .

with sulfur dioxide at 60-100° C. to reduce the pH to 7.0-9.5, the aqueous solution and sulfur dioxide flowing concurrently to minimize the effective contact between the sulfur dioxide and the hydrogen sulfide produced during sulfitation.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Broke disposal units for papermaking machines	Dominion Engineering Works Ltd	2,797,623	7/ 2/57
Felting apparatus	Hawley Products Co.	2,797,624	"
Glue roll wiper for a paperboard corrugating machine	Crown Zellerbach Corp.	2,797,661	"
Press mold for cold molding of cushions of coiled corrugated cardboard	Oscar L. Ladner	2,797,727	"
Corrugated board slitting machine	Elgin Corrugated Box Co. Inc.	2,797,751	"
Bottle carrier	Waldorf Paper Products Co.	2,797,845	"
Cigar box	Chester G. Myers	2,797,854	"
Package tray	Di-Cel Corp.	2,797,855	"
Handled cartons	Waldorf Paper Products Co.	2,797,856	"
Mechanism for facilitating the removal of paper from the drier	Raymond J. Robison	2,798,305	7/ 9/57
Web control for carton converting machine	Ex-cell-o Corp.	2,798,582	"
Paper sleeve fluorescent lamp wrapper	General Electric Co.	2,798,596	"
Carton for cans	Harold Grinspoon	2,798,603	"
Protective sleeve for chime of fiber drum	Continental Can Co. Inc.	2,798,654	"
Packaging carton for cans	Suther'and Paper Co.	2,798,655	"
Collapsible carton	Marathon Corp.	2,798,656	"
Expendable paperboard pallet	Arthur G. Mooney	2,798,685	"
Large fourdrinier papermaking machines	Black-Clawson Co.	2,799,209	7/16/57
Debarking apparatus	Terry Machinery Co. Ltd.	2,799,308	"
Display carton with folding easel	New Haven Board & Carton Co.	2,799,390	"
One-piece foldable display box and book combinations	Castle Offset-Printing Corp.	2,799,391	"
Match book	Thomas V. Lynch	2,799,392	"
Container for dispensing wrapping sheet material	Dow Chemical Co.	2,799,393	"
Dispensing opening for a fiberboard container	Crown Zellerbach Corp.	2,799,440	"
Dispensing container for razor blades	George E. Nerney	2,799,441	"
Box with automatic closure	Robert Gair Co. Inc.	2,799,442	"
Paper bags	Bishhoff & Klein	2,799,443	"
Hydraulic log debarker	Lemuel R. Forman	2,800,155	7/23/57
Collapsible cartons	Sutherland Paper Co.	2,800,250	"
Ice cream container	Waldorf Paper Products Co.	2,800,266	"
Rupturable container	Weinon Inc.	2,800,267	"
Handled container	Milprint Inc.	2,800,268	"
Method of making corrugated box blanks	Bestpak Inc.	2,800,840	7/30/57
Carton	William P. Frankenstein	2,800,999	"
Dispenser package	Mine Safety Appliances Co.	2,801,000	"
Holder for cone top cans	Container Corp. of America	2,801,001	"
Disposable container	Federal Paper Board Co. Inc.	2,801,039	"
Liquid-type cardboard container	Jagenberg-Werke A. G.	2,801,040	"
Leak-proof container	Chester E. Kruszynski	2,801,041	"
Waste sulfite liquor recovery	Harold O. Goddard	2,801,168	"
Method of completely resolving lignified cellulose	Alfred M. Thomsen	2,801,264	"
Apparatus for perforating paper	Peter J. Schweitzer Inc.	2,801,501	8/6/57
Apparatus for sealing containers	Crown Zellerbach Corp.	2,801,507	"
Moisture-resistant carton	Charles W. Ingham	2,801,577	"
Sectional shipping and display carton	Flex-O-Glass Inc.	2,801,739	"

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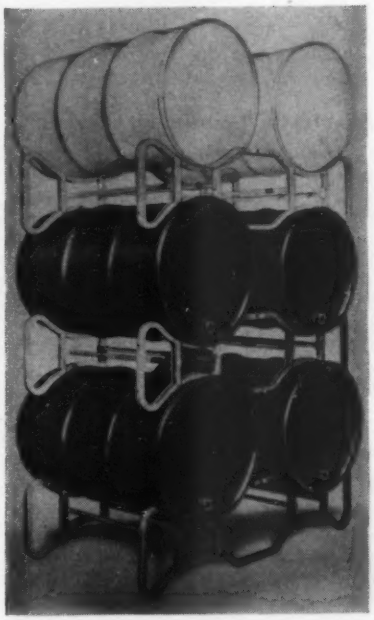

Steel rack for barrels

The steel racks pictured above were designed for stacking loaded or empty barrels and drums. The rack is also designed to permit easy handling with standard fork lift trucks. Each rack supports two barrels; and, as the photo shows, they can be interlaced to provide easy stacking of pairs to any practical height. *Republic Steel Corp.*

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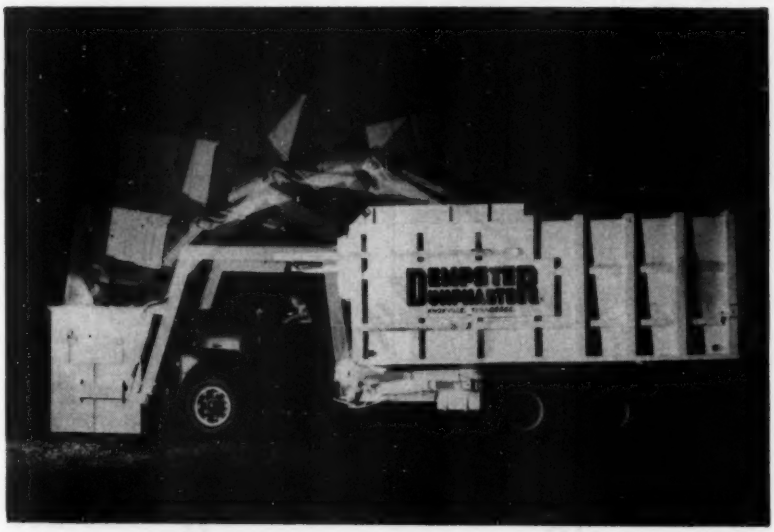

Dempster-Dumpmaster for mill use

The photo above shows the Dempster-Dumpmaster model CA. This model can develop a new system of industrial and paper mill waste collection.

The system would consist of this Model CA truck-mounted top-bay compactor body and mechanical lifting arms working in connection with waste storage containers located at points of waste accumulation throughout the mill.

A large mill is now testing the system, using 65 containers for temporary storage of waste pulp, rubbish and sludge. One Dempster-Dumpmaster empties each container several times a day and seven days a week. Such materials as beater waste are handled easily, the user has reported.

The pick-up, dumping and returning cycle requires less than 60 sec. and is performed without the driver leaving the cab.

Containers are available in 1- through 6-cu. yd. capacities with casters available on all models for inside plant accumulation points.

The manufacturer has prepared an illustrated manual describing the new system and will welcome your request in securing a copy. *Dempster Bros.*

Circle No. 11 on Readers' Service Card

Wire-braided steam hose

A wire-braided steam hose for high-pressure, high-temperature service is now available. Known as the Gibraltar steam hose, it is recommended for saturated steam pressures up to 200 psi or for handling super-heated steam at temperatures up to 385° F. Used for steam handling and steam jenny service, the hose is available in sizes from ½- to 2½-in. I.D. These sizes weigh from 62 to 230 lbs. per 100 ft. *Acme-Hamilton Mfg. Corp.*

Circle No. 14 on Readers' Service Card

Preservation of starch paste

Starch paste can be preserved and corrugated board made mold-resistant through the use of a fungacide called Dowicide G.

The chemical is in the water phase of the paste, some of it penetrates the paper on either side of the glue line, giving actual mold resistance to the liner and the corrugating medium. Thus by adding a permanent-type preservative to the liquid

paste, features of mold resistance to the glue line and liner are added.

The company is offering a booklet which gives technical information on this chemical. *Dow Chemical Co.*

Circle No. 15 on Readers' Service Card

Interlocked armored cable

An interlocked armored cable, now available, can be very satisfactorily used in pulp and paper mills because it offers the advantages of high resistance to harmful chemical action and easier installation and maintenance. Also, because of its protective metallic covering, the cable may be used without conduit.

The cable is available in 600-, 5000- and 15,000-v ratings with a galvanized steel, aluminum or bronze covering. Internally, the cable may be used for power and lighting, motor, control or overhead circuits. *Rome Cable Corp.*

Circle No. 16 on Readers' Service Card

Fire extinguisher

A new 3-lb. capacity dry powder fire extinguisher has been developed. It measures only 17½ in. high by 4¾ in. in diameter and weighs 8 lbs. fully charged. It is pressurized with 130 psi nitrogen and charged with specially-treated bicarbonate of soda, free-flowing, non-caking, non-toxic and non-abrasive.

A pressure gauge is marked for instant check on its operable condition. Any unreported use is signaled before the emergency of a fire. It can be used on fires where water cannot be used, such as electrical and flammable liquid fires. The effective range of the extinguisher is 10 to 12 ft. *Safety First Products Corp.*

Circle No. 17 on Readers' Service Card

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KALAMAZOO TANK & SILO CO.

90 yrs.

1867 . 1957

. . . in business

To twist a phrase, the first 90 years are the hardest. In that time we may not have found all the answers on engineering, materials, and construction of tanks, silos, and storage tanks but we've got most of them. Consequently you profit most by these 90 years when you bring your business to us.

So thanks for the many successful and happy years in business . . . if you have a specialized building program or problem, give us a call. Let's start the next 90 off on the right foot . . . for both of us.

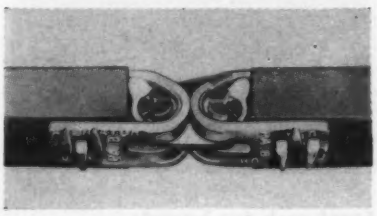
Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

All-plastic Y-sediment strainer

Made of highly corrosion resistant rigid polyvinyl chloride, this new strainer is designed for service on alkalis, acids, inorganic salt solutions and other corrosive materials.

The strainer has a service rating of 150 psi at 75° F and 75 psi at 150° F. It is available with either threaded, solvent-weld socket-type or flanged ends and comes in five sizes from ½ through 2 in. *Walworth Co.*

Circle No. 18 on Readers' Service Card



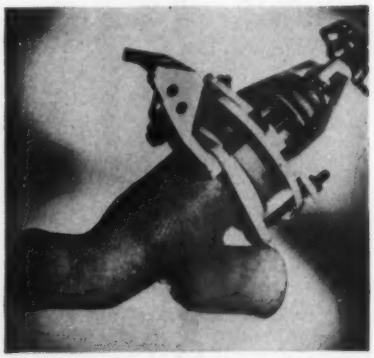
V-belt fasteners

Alligator aluminum-end plate fasteners made of strong aluminum alloy are now available for high-speed drives. It is stated that these fasteners reduce the whip of

the belt when belt speed is in the higher range.

Also available are permanently assembled fasteners. Where a separable joint is not required these new Alligator PA, B and C fasteners work very well. Complete information on these new developments is available. *Flexible Steel Lacing Co.*

Circle No. 19 on Readers' Service Card

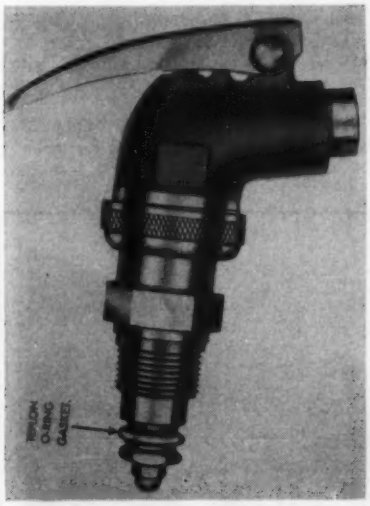


All-glass Y-type valve

Made of tempered Pyrex brand borosilicate glass, the new 2-in. Y-type valve is said to be corrosion resistant, compact, lightweight, tough and versatile. Acidic fluids of all concentrations or compositions at temperatures as high as 250° F can be handled by the valve.

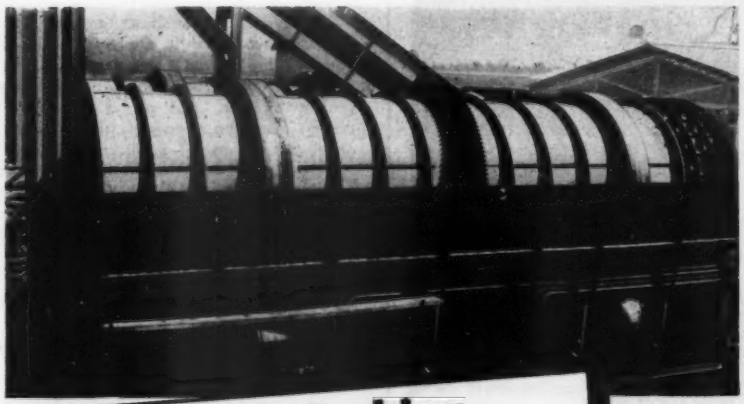
This valve can be easily mounted in any position through 360°. Its versatility is demonstrated by flanging procedure — flanges can be rotated on the valve body for easy alignment with bolt holes of connecting equipment. *Corning Glass Works.*

Circle No. 20 on Readers' Service Card



Drum faucet

A newly-improved, leak-proof, self-closing drum faucet has been developed. A



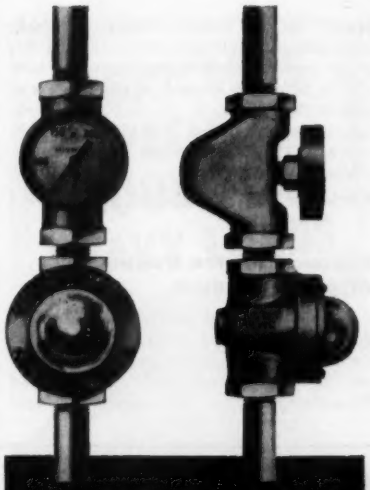
Thorough Barking
with minimum Brooming

Carthage Barking Drums

Carthage Barking Drums thoroughly remove the bark with minimum brooming of the logs. Heavy, all-welded design with full-length plates. Service life is exceptionally long and maintenance exceptionally low on these massive, heavy-duty barkers.

Write for Complete Information

CARTHAGE
MACHINE COMPANY CARTHAGE, NEW YORK



ARE ALL OF YOUR DRYERS DRAINING PROPERLY?

The best way to find out, day in and day out, is to have Ross Midwest Ball Sight-flow Indicators on your dryer discharge lines.

With these little sentinels on the job, a glance will confirm the proper condensate flow or warn you of an inadequate flow. Seldom, if ever, does the "window" cloud over and obstruct the view. All parts non-corrosive and good for years. All standard pipe sizes for pressures up to 125 pounds. Thousands in service on both wet end and dry end dryers.

Give pipe sizes when ordering.

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sturdy spring located within the body maintains a liquid-tight closure at all times. Hand pressure on the large lever-type handle is necessary to push spring back and permit flow of liquid. No seepage or leakage is possible when hand pressure is removed. The valve closes automatically. *Protectoseal Co.*

Circle No. 21 on Readers' Service Card

Chemical for the treatment of paper products

A new chemical product and method for the treatment of paper products to increase strength, rigidity, water resistance, etc. is now available under the name of Chemite. Treatment with Chemite is said to improve tremendously the surface on corrugated, chipboard and other porous paper stocks for lithography and letterpress printing and for writing with ordinary graphite pencil and fountain pen. *American Soluble Products Inc.*

Circle No. 22 on Readers' Service Card

Electro-magnetic disc brake

The recently introduced style UH 70 series offers units rated at 10, 15, 25, 35, 50 and 75 lb.-ft. maximum torque with Underwriters' approval for Class I Group D hazardous locations.

This series is provided with NEMA "C" bold circle and register suitable for mounting on rerated motor frames 213 thru 286 U. At the present time only the ac model is available. *Stearns Electric Corp.*

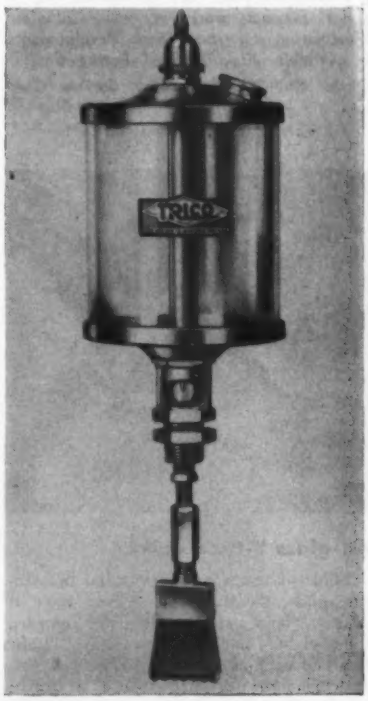
Circle No. 23 on Readers' Service Card

The "baby" of these three giant looms weaves a 240-inch width fourdrinier wire; the largest, a 292-inch wire.

This latest battery of looms — part of our continuing modernization program, — was added to serve the demand for increasingly large wires.

However, much smaller wires are still important to the greater part of the paper manufacturing industry, and our efforts are directed to producing — regardless of size — the very finest wires our 79 years of experience allow us.

EASTWOOD-NEALLEY CORP. BELLEVILLE NEW JERSEY



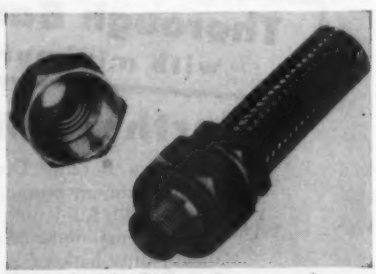
Chain oilers

The photo above shows a new chain oiler for automatically applying a film of oil to chains, gears, slides or irregular surfaces. Oilers can be mounted at any convenient location, and oil is released by gravity from the reservoir either manually or electrically to oil applicators.

The specially-designed applicators, which are not ordinary bristle brushes, withstand temperatures up to 275° F and can be trimmed to any width to avoid overhang and consequent side dripping.

A bulletin describing this oiler in more detail is available from *Trico Fuse Mfg. Co.*

Circle No. 24 on Readers' Service Card



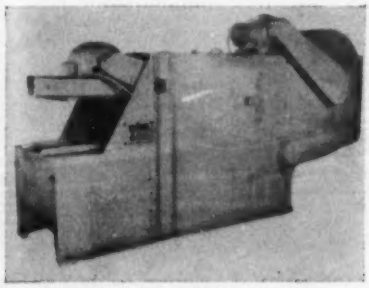
Detachable fitting for seamless metal hose

Illustrated above is the new, improved 1-in. N.P.T. type DT detachable fitting for seamless metal hose.

The new feature incorporated consists

of specially-formed concentric grooves and ridges in the internal flat seat of the end connector, shown separately. This new feature makes it unnecessary to smooth, file or grind the flat end of the flexible tubing, which merely has to be deburred. *Seamlex Co. Inc.*

Circle No. 25 on Readers' Service Card



Slab barker

Pictured here is a Hosmer S-4 Slab Barker. The machine is fabricated from heavy steel plate. All motor drives and other working parts are totally enclosed. In this one-man operation, 19½ hp is all that is required.

Slabs and edgings are conveyed through the barker on a heavy rubber belt with articulated hold-down rolls. Slabs up to 17 in. wide., 8 in. high and any length may be processed. Production averages over two cords per hour.

Bark removal is accomplished by a rotating hammer-head of new and fully-patented design. *Hosmer Machine & Lumber Co.*

Circle No. 26 on Readers' Service Card

Log debarker

The photo above shows a small mill log debarker which is said to debark a 20-ft.

Chemical Pulping Processes

The high degree of chemical, mechanical and physical control over materials and operations in the Chemipulp and Chemipulp-KC systems results in maximum plant output, high pulp quality and low operating costs.

- Circulating Systems
- Chip Distributor
- Chip Pretreatment
- Waste-Liquor SO_2 Gas and Heat Recovery
- Independent Recovery System
- Jet-Type Sulphur Burners
- Hot Acid System
- Hydroheater
- Spray-Type SO_2 Gas Cooling System
- Acid System *(Bubble Absorption)*

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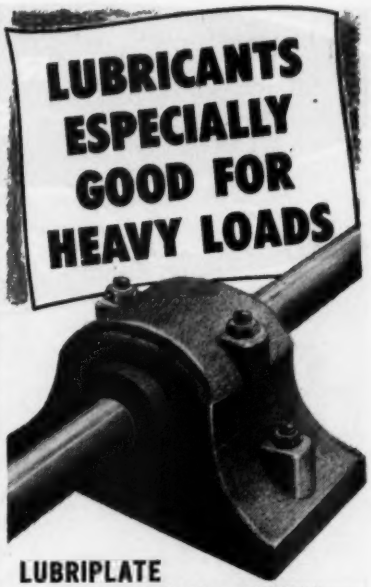

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are grease type lubricants especially formulated for use in bearings and on other machine parts subject to heavy loads. Have extremely high film strength, marked adhesiveness and water repellence.

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Nos. 4 and 8
are most satisfactory fluid type lubricants over a wide range of temperatures. Due to their high film strength, they are ideal for use where heavy loads are encountered.

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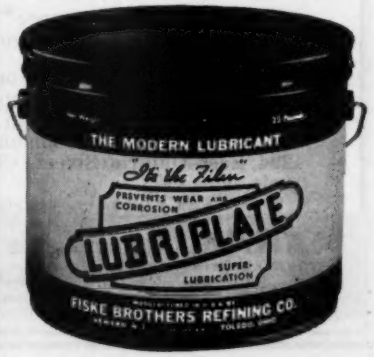

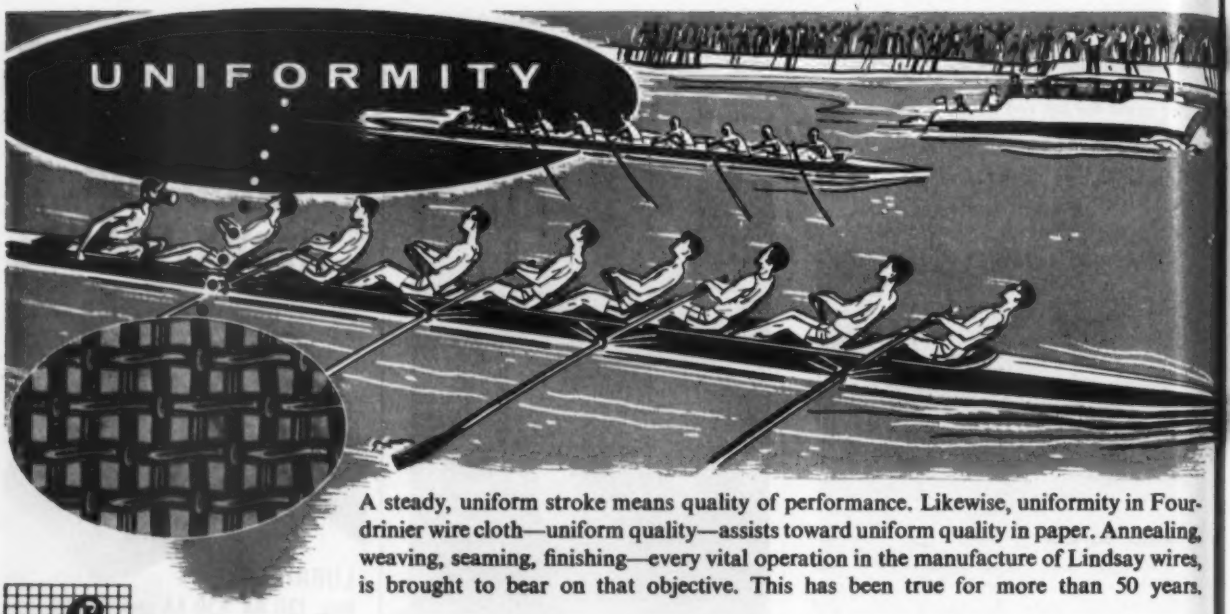

A steady, uniform stroke means quality of performance. Likewise, uniformity in Fourdrinier wire cloth—uniform quality—assists toward uniform quality in paper. Annealing, weaving, seaming, finishing—every vital operation in the manufacture of Lindsay wires, is brought to bear on that objective. This has been true for more than 50 years.

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FOR PAPER MANUFACTURING

THE LINDSAY WIRE WEAVING COMPANY
Cleveland 10, Ohio

REMINDER

ASKANIA Stock Level Control provides:

1. Instant response to either small or sudden large changes in stock level
2. Sufficient power to actuate largest and heaviest valves
3. Operation of minimum and maximum flow valves in sequence
4. Unlimited turndown
5. Lowest maintenance cost for any stock level control element

For *complete* information on what it does, where and how it can be applied, and how it works, send for bulletin Nos. 165 and 26.3. Write Askania Regulator Company, 294 East Ontario Street, Chicago 11, Illinois.

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"CONTROLS FOR INDUSTRY"
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A SUBSIDIARY OF CPC

BURGESS-MANNING
"WSS" WATER SEPARATOR SNUBBERS

- **Silence water-sealed vacuum pump exhausts**
- **Remove 100% of water from exhaust**

Particularly adapted to the paper mill where any content of water in the exhaust gases from vacuum pumps is costly and dangerous. The "WSS" will accommodate water having a percentage of settlings and impurities — convenient clean-outs are provided. Water is removed centrifugally and drained off at the bottom of the unit. Standardly available in sizes from 1½" to 12". Also models to meet unusual and corrosive conditions, and sizes larger than 12".

Ask for Bulletin No. 270

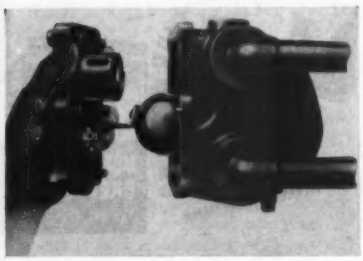
BURGESS-MANNING COMPANY
777 East Park Avenue, Libertyville, Illinois

New Products . . .

log 6-34 in. in diameter with minor variations.

This debarker is known as the Hosmer L-20. It weighs about 7500 lbs. The barking head is the key feature of this machine. It is said to remove bark under almost any weather conditions and will function on most types of logs. *Hosmer Machine & Lumber Co.*

Circle No. 27 on Readers' Service Card



Float-thermostatic steam trap

Here is the Float-thermostatic steam trap (type FT) which is now available. The entire operating element of the new FT trap is one unit, which can be removed without disturbing inlet and outlet connection to the semi-steel trap body, suitable for 125 psi steam pressure.

Operating elements consist of stainless steel valve mechanism, copper float and a bronze thermostatic air vent. *Sarco Co. Inc.*

Circle No. 28 on Readers' Service Card

Fork truck for rough terrain

Here is a logging fork truck that is said to lift and carry 30,000 lb. of logs in any weather over mud, snow, sand and rough terrain.

Named the Ranger 300 "Logger", the machine features four-wheel drive, power brakes, power steering and a power shift and also a four-speed transmission.

The unit is available with either a General Motors diesel engine of 283.7 cubic inch displacement or a Hercules gas engine of 501 cubic inch displacement. The forks are 72 in. long and can be laterally adjusted more than 9 ft. for carrying exceptionally long logs. *Clark Equipment Co.*

Circle No. 29 on Readers' Service Card

Pallet turntable

This unit simplifies and accelerates the hand palletization operation by uniformly

Nine Publications for Papermakers

Pulp and Paper, Volume I (Casey)	$18.00
Pulp and Paper, Volume II (Casey)	18.00
Paper and Paperboard Making (Williamsen)	6.00
Technology of Paper Coating	2.00
Lessons in Papermaking—Part 1	1.50
Lessons in Papermaking—Part 2	1.50
Notes and Observation on Beaters	1.00
Trouble on the Paper Machine	.75
Technology of Papermaking Fibres	.50

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DRUPA 1958

ENGLISH ECCO CLAYS TRADE MARK **CLAYS**

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New Products . . .

positioning the pallet. The unit also provides two surfaces for locating cases on the pallets, which means that the units are quickly, easily and accurately positioned on the pallet for a uniform and more stable load.

The turntable is designed to handle both two-way and four-way pallets up to 48 × 48 in. and loads up to 4000 lb. per pallet. No air or electrical supply is required. *Lamson Corp.*

Circle No. 30 on Readers' Service Card

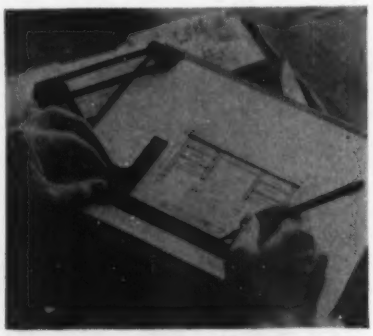
Microscope, projector, comparator and camera

Now available is a Swiss optical precision unit called "Projectina". This unit combines a portable microscope, projector, comparator and camera.

With the accent on rapid interchange of choice optics and photographic equipment, the unit finds its rightful application in every growth area of industry. By fitting a simple adapter to the observation face of the instrument, any image previously projected on the screen in the magnification range 7× to 2000× may instantly be photo-recorded with either the Graflok back or Polaroid Land back in black and white or color.

The company welcomes your request for a bulletin, which is fully illustrated with samples of work done by the unit along with technical data. *Alfred Hofmann & Co.*

Circle No. 31 on Readers' Service Card



Portable drafting machine

A new-design portable drafting machine which is pictured above is said to be so compact that it can be folded jackknife-style to fit in the pocket when detached from its drawing board.

Called Draftette, the precision instrument is now available attached to a portable drawing board that fits easily into a briefcase. *David Miller & Associates.*

Circle No. 32 on Readers' Service Card

Now available in book form

Technology of Paper Coating

by H. Witcoff
Director of Chemical Research, General Mills Inc.

and A. W. J. Dyck
Editorial Director, The PAPER INDUSTRY

The latest developments in the technology of paper coating are brought to the reader clearly and concisely in this new book that is based with some revision on a series of articles appearing in The PAPER INDUSTRY from May 1956 through May 1957.

The up-to-the-minute techniques in general use are described in detail. Various specific methods of on-the-machine and off-the-machine coating processes are described and illustrated. Of major importance is the discussion of properties and uses of new as well as established organic and inorganic coatings in wide and specialized usage. A number of typical formulations are shown.

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Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in two sizes: "A" size, 8½" x 11½", and "B" size, 17x23". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

NEW LITERATURE

Books

SYMPOSIUM ON TENSION TESTING OF NON-METALLIC MATERIALS. Published by the American Society for Testing Materials, 1916 Rase St., Philadelphia 3, Pa. 81 pages. $2.00 ($1.50 to members).

This publication includes five papers on the testing of plastics, adhesives, rubber, wood and paper. It discusses aspects of one of the simplest tests which can be made on any material.

Four objectives of this symposium are: (1) an accurate summary of present practices in fields where tension testing is most widely used; (2) a critical appraisal of their merits and deficiencies; (3) an opportunity to compare techniques and terminology among the various fields, and (4) a guide to future development and standardization.

Charts, graphs and photos are also given throughout the book.

NATURAL AND SYNTHETIC FIBERS YEARBOOK 1956. Prepared under the editorship of Milton Harris and H. Mark. Published by Interscience Publishers Inc., 250 Fifth Ave., New York, N.Y. 947 pages. $45.00.

A collection of abstracts of papers dealing with properties and behavior of natural and man-made fibers is well presented within the 947 pages of this book.

The material was originally published in outstanding journals during 1956 in the U. S. and in foreign countries.

Although the information is presented in the form of abstracts, these abstracts differ from those conventionally used. They are far more complete and generally contain original data, graphs, charts, photographs, etc.

This bound and indexed volume of these papers will make this book more easily accessible in libraries for reference purposes and of special value and use to many of the workers in the textile field as well as to those in the allied chemical field.

USDA Reports

SILVICAL CHARACTERISTICS OF QUAKING ASPEN. This report is another of the series being prepared by the Lake States Station covering the information concerning the silvical characteristics of different species. This particular report deals with the quaking aspen. This subject has been prepared by R. O. Strothmann and Z. A. Zasada. It contains 26 pages of descriptive literature including photos and charts. Copies are available from Lake States Forest Experiment Station, St. Paul 1, Minn. Ask for Station Paper No. 49 dated July 1957.

TECHNICAL NOTES — from the Lake States Forest Experiment Station. Here is a listing of three Technical Notes, which are available by writing to: Lake States Forest Experiment Station, St. Paul 1, Minn.

No. 510—Is the Epicormic branching associated with hardwood pruning wounds influenced by tree crown class? No. 511—Disking increases the number and growth of yellow birch seedlings. No. 512—Growth of established balsam fir reproduction greatly stimulated by cutting.

JACK PINE SAWFLY. Herbert G. Ewan, entomologist at Lake States Forest Station, has given a description of the Jack Pine Sawfly in Forest Pest Leaflet No. 17 dated June 1957. He has outlined the feeding habits, life history, natural control and preventive measures which can be taken for the control of this pest. Copies are available from Forest Service, U. S. Department of Agriculture, St. Paul 1, Minn.

NATURAL REGENERATION—on a 2-acre mixed-oak clear cutting five years after logging. Harold F. Scholz and A. J. DeVriend have shown a case history of an oak clear cutting in this report. Photos and charts are also included. A copy of this Station Paper is available from Lake States Forest Experiment Station, St. Paul 1, Minn. Ask for Station Paper No. 48 dated July 1957.

Booklets and Pamphlets

WOOD PULP, PAPER AND BOARD. Prepared by the Bureau of the Census, Industry Div., U. S. Department of Commerce.

The data presented in this report continues the annual series established by the Bureau of the Census for the pulp, paper and board industry. The statistics represent a complete coverage of the operations of all known wood pulp, paper and board mills.

Copies of this report are available from the Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C. The price is 15c per copy.

SIMPLIFIED PRACTICE RECOMMENDATION OF DIAZOTYPE AND BLUEPRINT PAPER (Sheet and roll sizes). Published by the Commodity Standards Div., U. S. Department of Commerce.

This practice recommendation R260-57 proposed by the National Association of Blueprint and Diazotype Coaters establishes 11 standard sizes of diazotype paper in sheets and six standard widths of diazotype and blueprint paper in rolls.

Printed copies of R260-57 may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Single copies are 5c. A discount of 25 per cent will be allowed in orders of 100 or more copies.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Antifoam for coatings and adhesives

Hodag Chemical Corp. A factual information sheet describing the properties and applications of the company's Antifoam TBX is now available. This antifoam is designed especially for coatings and adhesives as an antifoam and leveling agent. It is effective for systems based on starches and dextrines, natural proteins and synthetics.

Circle No. 33 on Readers' Service Card

Dust collector

Buell Engineering Co. is offering a 4-page reprint of a technical article covering a two-stage, cyclone-and-precipitator dust collection system which is said to be 98.5 per cent efficient. The text describes the installation and explains how each unit operates and how the system ties in with the production process.

Circle No. 34 on Readers' Service Card

Pulp bleaching equipment

Sandy Hill Iron & Brass Works has released Part A of Section 2 of the company's centennial catalog. Section 2 in its entirety will cover a broad range of equipment in the pulp processing field. Part A deals specifically with pulp bleaching equipment. Part B of Section 2 will be released soon. Section 1 is still available from the company and describes Sandy Hill fourdrinier machines.

Circle No. 35 on Readers' Service Card

Processing equipment

Sprout, Waldron & Co. Inc. has just released a 20-page bulletin to the processing and pulp and paper industries. This booklet is a general introduction to the complete line of processing equipment manufactured by the company. Each product has been described with technical information and photos along with application data.

Circle No. 36 on Readers' Service Card

Guar gum for the paper industry

General Mills Inc. has published a bulletin titled, "Guartec for the paper industry". This bulletin tells how the company's guar gum can be used to improve printing paper quality while

reducing mill costs through increased production. It shows how Guartec can be used either alone or blended with starches as a wet end additive or added dry to beater or chest.

Circle No. 37 on Readers' Service Card

Light-weight, venturi-type desuperheater

Schutte & Koerting Co. has just published a bulletin describing a new line of venturi-type desuperheaters developed as companion units to current SK venturi-type desuperheaters but with emphasis on lighter weight and flexibility in water inlet location.

Circle No. 38 on Readers' Service Card

Optical tooling

Keuffel & Esser Co. A new 56-page manual covering the basic principles of optical tooling has just been issued by the company. Photographs and drawings illustrate the major instruments and accessories used in optical tooling. Drawings show the optical principles used in applying the equipment.

Circle No. 39 on Readers' Service Card

Computers in the process industries

Beckman Instruments Inc. is issuing a reprint of an article entitled "Computers in the process industries". The article gives an interesting analysis of past, present and future applications for computers in process control. It also describes various aspects of the data aquisition, the processing necessary on this data, and the over-all system reliability resulting from the use of computer control.

Circle No. 40 on Readers' Service Card

Liquid electrical contact cleaner

Caig Laboratories is offering data on the company's new product called Cramolin. Cramolin is a liquid electrical contact cleaner that has been thoroughly tested and is said to work especially well on older electrical contacts that have seen considerable service. It is a cleaner, preservative, anti-corrosive and a lubricant for electrical contacts of almost all types and conditions.

Circle No. 41 on Readers' Service Card

Heavy-duty agitator

Kraft Equipment Co. Inc. has prepared a descriptive folder showing the varied types of machinery currently being designed and manufactured by the company. Among the items shown are: a 48-in. heavy-duty horizontal propeller-type agitator; a 70-ft. flume conveyor for handling pulpwood; a diaphragm lime sludge pump; a 60-ft. 120-in. swing-dia. vertical agitator for the diffuser and hi-density stock chest agitator. The company welcomes your request for this folder.

Circle No. 42 on Readers' Service Card

Paper machine rolls

Mount Hope Machinery Co. has released its second bulletin describing the company's machine rolls. This bulletin is in the shape of a file folder as was the first bulletin published and gives further technical details on how these rolls are used.

Circle No. 43 on Readers' Service Card

Dryer drainage system

Stickle Steam Specialties Co. is offering a 4-page bulletin illustrating and describing the improved vacuum differential drainage system for paper dryers. This system is designed for use on paper machines operating at medium and low pressures and on vacuum.

Circle No. 44 on Readers' Service Card

Flat bed drainer

Sprout, Waldron & Co. Inc. has just announced its new bulletin on the flat bed drainer —a product designed to increase the efficiency of any pulp feeding system. The product drains chips, rejects and high freeness material, assuring proper consistency of stock and provides a steady, even feed to the refiner or subsequent equipment.

Circle No. 45 on Readers' Service Card

Recovery and reuse of boxboard mill effluent

Graver Water Conditioning Co. has published a new article which discusses the recovery operation at a paper mill. It discusses the problems encountered by the mill when increased capacity required effluent treatment. The paper presents the problems and shows the solutions.

Circle No. 46 on Readers' Service Card

Saturable power reactors

Barber-Colman Co. has prepared an application guide on saturable power reactors. This 32-page booklet discusses turndown characteristics and the application of automatic control to these units.

Circle No. 47 on Readers' Service Card

Industrial-type battery chargers

Automatic Switch Co. is offering a bulletin which describes the company's industrial-type battery chargers. The charger is equipped with a number of modified features.

Circle No. 48 on Readers' Service Card

Chip screening

Orville Simpson Co. has published a bulletin describing the new Rotex chip screener. The bulletin gives photos of three different models of this machine along with other technical data.

Circle No. 49 on Readers' Service Card

Flexible couplings

Link-Belt Co. has a new book describing its complete line of improved geared flexible couplings. The 12-page book details pertinent application and selection data for couplings with maximum bores ranging up to 7 in. and ratings from 2½ to 572 hp per 100 rpm. The book also gives details for application.

Circle No. 50 on Readers' Service Card

Maintenance tips for unit heaters

Air Moving & Conditioning Association gives valuable tips on what to do and what not to do in installing and caring for unit heating equipment in a new 4-page bulletin just published.

Circle No. 51 on Readers' Service Card

Hardening and dustproofing concrete floors

L. Sonneborn Sons Inc. is issuing a 2-color circular featuring the advantages of Lapidolith—the original patented product used for chemically hardening and dustproofing concrete floors.

Circle No. 52 on Readers' Service Card

Comprehensive study of cellulose acetate butyrate as protective coating

Eastman Chemical Products Inc. has completed a 75-page study of the chemistry and physical behavior of cellulose acetate butyrate in protective coatings. The study represents a comprehensive summary of the laboratory and commercial experience gained by Eastman chemists in over 27 years of work with this cellulose ester. Designed for use by those working in the field of protective coatings, the study contains numerous solubility and compatibility charts and tables and is thoroughly indexed for convenient reference.

Circle No. 53 on Readers' Service Card

PAPER CONDITIONING

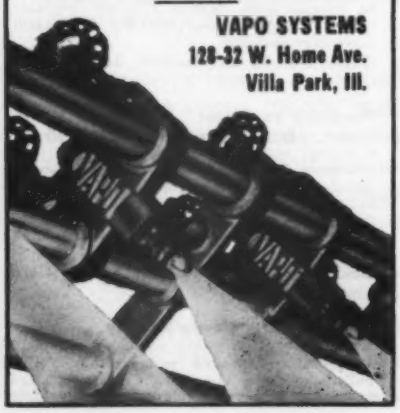
THE MODERN EFFICIENT ECONOMICAL WAY

BUILT TO OPERATE AT ANY MACHINE SPEED

SYSTEMS ALSO BUILT FOR APPLYING SIZING MATERIALS, STARCHES, WAX EMULSIONS, PLASTICISERS AND OTHER SURFACE FINISHING SOLUTIONS

BUILT FOR MANUFACTURING OR CONVERTING PROCESSES

VAPO SYSTEMS
128-32 W. Home Ave.
Villa Park, Ill.



The Paper Industry

Professional and Business Services

Engineers — Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys
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SOUTH CAROLINA

Pulp and Paper Specialists
CALKIN & BAYLEY, INC.
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We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "O" and instruction sheets free.

The N. P. BOWSHER Co., South Bend, Ind.

CLASSIFIED ADVERTISING

ENGINEER WHO HAS DESIGNED OR SUPERVISED CONSTRUCTION OF A PAPER MILL

A unique, important position is available with a leading manufacturer and builder of paper making machinery now expanding and diversifying its operations.

The man we seek must have at least 5 years all around experience in complete paper mill operation, knowledge of stock preparation, paper making and converting machinery as well as the architectural and structural construction of a paper mill. Engineering degree or equivalent experience — preferably mechanical—required. Age to 45. Position involves travel abroad.

Salary is open, benefits comprehensive. Location is in an attractive, congenial, medium size community with fine housing and schools. Several large metropolitan cities are nearby. RELOCATION COSTS FULLY PAID.

Our staff knows of this advertisement.

Please forward a complete resume or letter of your qualifications and include your phone number. Your reply will be held in strict confidence.

Box 660, The Paper Industry

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

AGENTS

Wanted to sell new Tin base slime control material. Non-corrosive to wires. Paper mill personnel may act as agents in spare time. Confidential. Write Box 657, The Paper Industry.

CHEMICAL ENGINEER

For the position of Assistant Technical Director in an Ontario pulp and paper mill. Age under 35. Excellent opportunity for the right person. Write Box 658, The Paper Industry.

FOR SALE

Peerless Vertical Fire Pump — Unused
1000 G.P.M. — 240 ft. Head
Motor 75 H.P. 1800 R.P.M.
Head 12C with 8" underground discharge
Air Release Valve and Fittings
Control Panel — Lexington Combination
Address all replies to Box 659, The Paper Industry

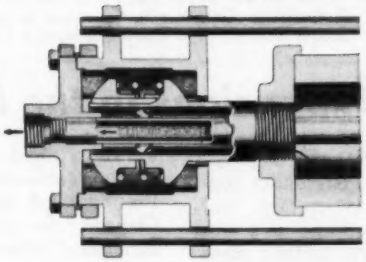
REPRESENTATIVE WANTED

Sales service representative with chemical training and paper mill experience, emphasis on sizing operations, to call on paper mills for established chemical company. Reply giving education, experience, and background to Box 661, The Paper Industry.

JOHNSON JOINT

ROD-SUPPORTED TYPE

The Type LJ Johnson Joint has lugs cast right on the body to accommodate supporting rods. This design lifts the weight of the body from the rotating assembly—permits it to "float" freely inside. Joint shown at left is for syphon pipe service, has steam inlet in side of body 90° from lugs. Type LJ is also available for thru flow service.



Write for complete information. Johnson Joints are also furnished in pipe-supported and self-supported types.

The Johnson Corporation

845 Wood St., Three Rivers, Mich.

You Can Be Sure!

with the PHOTOVOLT Photoelectric REFLECTION METER

for accurate measurement of

Brightness and Opacity

of pulp and paper in terms of TAPPI specifications.

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tests on paper, card board, and other paper products.

Portable, reliable, rugged, simple to operate

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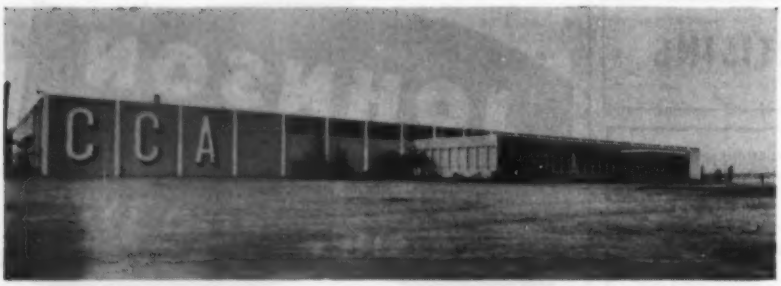

A GIANT "VACUUM CLEANER" is the special feature of this new Renton, Wash. plant of Container Corp. of America. The $900,000 folding carton production unit was placed in operation October 9 and boasts modern multi-color printing presses, die-cutting presses, waxing machines and high-speed folding and gluing equipment. Paperboard is supplied by company mills at Los Angeles and Santa Clara, Cal., and at Tacoma.

The vacuum disposal system handles paper waste from the cutting machines. The scrap is then shipped to one of Container Corp.'s mills for reuse as paper stock in producing paperboard. This giant "vacuum cleaner," it is claimed, effects a substantial saving in labor.

Recent Expansions in the Industry

Fort Howard Paper Co.
of Green Bay, Wis., has under construction a material storage and stock preparation building at a cost of $200,000. The firm further plans to erect an office building costing approximately $150,000. Groundbreaking is scheduled for spring.

Champion Paper & Fibre Co.
will build a general office building in Hamilton, Ohio, to house all departments of the general office staff. Preliminary plans call for nearly 40,000 sq. ft. of office and reception area in a T-shaped two-story portion and approximately an equal amount in a one-story extension.

Royal Container Co.,
San Francisco manufacturer of corrugated cases and other containers, has reached a manufacturing agreement with Georgia-Pacific Paper Co. Under the plan, Royal will convert (at Millbrae, Cal.) kraft linerboard from G-P's pulp and paper mill now nearing completion at Toledo, Ore., thus achieving a wholly integrated operation.

Imperial Paper Box Corp.,
Brooklyn, N. Y. manufacturer of record album covers, has established a West Coast plant at Vernon, Cal.

Nova Scotia Pulp Ltd.'s
proposed $40,000,000 pulp mill in the Strait of Canso area appears more certain with the announcement that the target date for construction is but 14 to 17 months off. The plant would produce more than 300 tons of high-grade bleached pulp per day. President of the firm is Karl A. Clauson, president of the North American subsidiary of Stora Kopparbergs of Sweden.

Allied News Notes . . .

Crucible Steel Co. of America has acquired (subject to SEC approval) 100-per cent ownership of Rem-Cru Titanium Inc., producer of titanium and vacuum arc-melted steel products.

Black-Clawson Co. has acquired the Sutherland refiner, breaker trap and pressure washer business in the United States, Canada and certain overseas markets. The Sutherland firm, with headquarters in Trenton, N. J., is a 20-year-old supplier of heavy machinery for refining papermaking pulp.

Lockport Felt Co. held open house for officers and directors recently at its plant in Starkville, Miss. Completed in 1955, the mill operates in close conjunction with the headquarters plant at Newfane, N. Y.

Farrel-Birmingham Co. Inc. has moved its Akron, Ohio office to more spacious quarters at 665 West Market St.

Raybestos-Manhattan Inc. has completed the expansion of its plant and facilities at Neenah, Wis. The project increased roll-covering capacity by 50 per cent.

National Aluminate Corp. has more than doubled its administrative and laboratory facilities in Chicago.

American Cyanamid Co. will expand its Mobile, Ala. plant to include the production of wax sizes.

Samuel M. Langston Co. recently staged a class in the operation and maintenance of corrugating equipment for engineers and supervisory personnel from England, Denmark and Canada. Paper mills and converters were represented.

Morningstar, Nicol Inc. has acquired Federal Adhesives Corp. and its affiliates. Federal Adhesives operates in a field similar to Morningstar, Nicol's subsidiary, Paisley Products Inc. — specialty adhesives. The affiliation includes Federal Latex Corp., which manufactures rubber latex compounds, and Federal Chemical Corp., manufacturer of industrial chemicals and vinyl plastisols.

A merger of **Midland Steel Products Co.** and **J. O. Ross Engineering Corp.** has been announced. When the merger is ratified, the combined company will be known as Midland Ross Corp.

Hudson Sharp Machine Co. of Green Bay, Wis., a subsidiary of Food Machinery & Chemical Corp., has announced that a 4200-sq. ft. addition will be constructed to its present plant for the expansion of its engineering department.

News of the Industry . . .
(Continued from page 797)

Coming Events

Tappi

Jan. 23—Kalamazoo Valley Section, Hotel Harris, Kalamazoo, Mich. (joint meeting with Michigan Div. Superintendents)
Jan. 24-25—Southeastern Section, George Washington Hotel, Jacksonville, Fla.
Jan. 30—Delaware Valley Section, Engineers Club, Philadelphia.

Superintendents Association

Jan. 21—Miami Valley Div., Manchester Hotel, Middletown, Ohio.
Jan. 23—Michigan Div., Hotel Harris, Kalamazoo, Mich. (joint meeting with Kalamazoo Valley Tappi).
Feb. 13—Michigan Div., Hotel Harris, Kalamazoo, Mich.

Other meetings

Jan. 14-15—Instrument Society of America (Yankee Instrument Fair and Symposium), Hotel Bradford, Boston.
Jan. 23—Second Annual Pulp & Paper Conference, Western Michigan University, Kalamazoo, Mich.
Jan. 27-30—Plant Maintenance & Engineering Conference and Show, International Amphitheatre, Chicago.
Jan. 29-31—CPPA Technical Section (annual meeting), Mount Royal Hotel, Montreal
Feb. 3-4—Instrument Society of America, National Conference on Progress and Trends in Chemical and Petroleum Instrumentation, Wilmington, Del.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	—

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.60— .65
No. 2 roofing (Chicago)	.40— .45
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites, miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light prints	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Dark cottons	
Old shopperies	

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	4.75— 5.00
Gunny No. 1, foreign	4.50— 5.00
No. 1 manila rope, domestic	7.75— 8.25
No. 1 manila rope, foreign	6.25— 6.50
New burlap cuts (soft)	6.00— 6.50
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—115.00
No. 1 hard white shavings	85.00— 90.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	55.00— 65.00
Fly leaf shavings No. 1	25.00— 30.00
Fly leaf, woody, No. 1	25.00— 30.00
Mixed colored shavings	18.00— 20.00
No. 1 books and magazines	17.00— 18.00
Ledger stock, white, No. 1 (carloads)	40.00— 45.00
Ledger stock, colored, No. 1 (Midwest ship)	25.00—
New manila envelope cuttings (free of groundwood)	60.00— 65.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	50.00— 60.00
Colored tab cards	40.00— 50.00
New northern kraft envelope cuttings	60.00— 65.00
Triple sorted kraft, 100%	25.00— 30.00
No. 1 old kraft	25.00—
White news cuts, No. 1	50.00— 55.00
No. 1 overissue news	14.00— 16.00
Folded news, special	15.00— 16.00
Folded news, ordinary	12.00— 14.00
Old corrugated boxes	23.00— 24.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	6.00— 7.00
No. 1 mixed paper	2.00— 5.00

CHEMICALS

F.o.b. New York City

Alum, ammonium Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt	5.05—
Powdered, drums, works, cwt	5.20—
1-Arginine, drums, kilo	74.80—
Blanc Fixe Direct process, bags, c.l., works, ton	115.00—
L. c. l, ton	125.00—
Bleaching Powder, drums, cwt	
Casein, domestic acid precipitated 30-mesh bags, 10,000-lb. lots or more, shipping point, lb	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb	.64—
China Clay, domestic dry-ground, airfloat, 99% 325-mesh, bags, c. l., Georgia works, ton	10.00—
300-mesh, bags, c. l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid Tanks, single units, works, freight equaled, cwt	3.15—
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29½—
Litharge, commercial powdered Barrels, c. l., works, freight equalled, lb.	.15¼—
Rosin, gum, c. l., f.o.b. New York, cwt E	—
F	—
G	8.75—
WW	9.40—
Rosin, wood, c. l., f.o.b., shipping point, cwt. K, M	7.60—
N	7.70—
WG	8.15—
WW	8.40—
Saltcake, domestic, bulk Works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c. l. works, cwt	1.85—
Soda, caustic Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—
Solid, 76%, drums, c. l. works, cwt.	4.30—
Sodium Silicate 40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—
Starch Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude Bulk, c. l. mine, contract, long ton	25.00—
Talc Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment Calcium-rutile base, regular, bags, c. l., lb.	.09¼—
High-tinting, drums, c. l., lb.	.09 —
Zinc Oxide Pigment, American process Lead-free, bags, c. l., freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	
Sulfate screenings	
Groundwood, dom.	82.50— 90.00

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more): Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated .020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt): No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000-lb., ream sealed cartons): 100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons): No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons): No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.50
Butchers, counter rolls	10.50
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

Names in the News . . .

(Continued from page 801)

Champion Paper & Fibre Co. as a consultant. His primary function will be in the field of international trade and associated subjects.

T. Marcus McClellan, formerly a vice president, has been elected president of Birmingham Paper Co. in Birmingham, Ala. He succeeds his father, T. Marcus McClellan Sr., founder of the company and its only president until his recent death.

Kenneth K. Nielsen, general logging superintendent for Anglo-Canadian Pulp & Paper Mills Ltd., has been appointed to a similar post for Dryden Paper Co. Ltd. At the same time, **G. K. Seed,** a member of the operating staff since 1956, was made assistant general superintendent; and **W. F. Beatty,** a camp clerk and divisional forester, was named assistant district superintendent.

K. K. Nielsen

T. H. Mittendorf

T. H. Mittendorf has retired as executive vice president of Hudson Pulp & Paper Corp. He joined the firm as vice president in charge of sales in 1948. Prior to that time he was associated with Gummed Products Corp. of Troy, Ohio, as vice president and general manager.

Claude M. Stitt, a veteran in the field of practical engineering and plant management, has been appointed manager of the newly created Resources Development Department of Fibreboard Paper Products Corp. He will headquarter temporarily at Antioch, Cal.

Charles Horner, president of Kosmos Portland Cement Co. of Louisville, Ky., has been elected a director of Flintkote Co. (The Kentucky firm recently became a wholly owned operating subsidiary of Flintkote.)

Kenneth Grace of Port Arthur, Ont., has joined the Technical Service Department of West Virginia Pulp & Paper Co. at Luke, Md. He was formerly mill technical service engineer for Provincial Paper Ltd.

John H. Symes, chief chemist at the Big Island, Va. plant, has been named assistant superintendent of the Owens-Illinois Glass Co. pulp mill at Valdosta, Ga. He was associated with National Container Corp. when that firm was merged into O-I in the fall of 1956. He has been succeeded at Big Island by **Benno J. Beau,** who joined National Container in 1948 as a chemical engineer.

Richard V. Osborn has been named technical director for Great Northern Paper Co. at Millinocket, Maine. He was formerly technical director for Finch, Pruyn & Co. Inc. at Glens Falls, N. Y.

Everett T. Mauger has been named head of market research for Alton Box Board Co. at Alton, Ill. For the past 11 years he has been associated with the New York, N. Y. firm of Lionel D. Edie & Co. as a consultant in economics and business trends.

Allied Personalities . . .

George J. Volin, a design engineer for E. D. Jones & Sons Co., has won the $4,000 second prize in a contest for the design of machines improved through arc welding. The competition was sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland.

Lindsay Bleakley, with the firm since 1950, has been named general manager of East Chicago Machine Tool Corp.

Dr. Ephraim Kaplan, formerly with Vico Products Co., has been named director of research and development for Hodag Chemical Corp. At the same time George Londos, associated formerly with Ninol Laboratories, was named a research chemist working on special surface active agents.

Bruce Pickering, formerly with Southland Paper Mills Inc., and **Gordon White,** at one time associated with Champion-International Co., have been named field service engineers for F. C. Huyck & Sons.

Howard E. Nehms, formerly manager of the division's refinery chemicals department, has been named general sales manager for the Industrial Chemicals Div. of American Cyanamid Co.

Wallace & Tiernan Inc. has reported promotions: **Thomas T. Quigley,** executive assistant to the vice president, becomes director of the equipment divisions; **Russell C. Clement,** manager of field sales and service, becomes director of sales for chlorination and chemical feeding equipment, and **Donald N. Hale,** a 21-year veteran with the firm, becomes production manager.

R. M. Stampley, formerly with Dorr-Oliver Inc., has been appointed to the sales staff of West End Chemical Co.

Carl F. Hoelderle, lake states regional sales manager, has completed 25 years' service with the Corn Products Department of Anheuser-Busch Inc.

Chicago Bridge & Iron Co. has announced three transfers: **Arthur R. Simpson,** a member of the general sales staff, assigned to the Chicago sales office; **James R. Mansell,** from Birmingham, Ala., to the Houston sales office, and **George M. Rowley,** from the Hillside, N. J. erection district, to the Boston sales office.

Joseph D. Gavin, manager of the sheet and strip order department, has been appointed manager of sheet and strip sales at the Chicago plant of Joseph T. Ryerson & Son Inc.

Necrology . . .

Lawrence D. Morton

Lawrence D. Morton, 79, sales manager for Hinde & Dauch Paper Co. until his retirement in 1944, died late in October at his Sandusky, Ohio home. (Hinde & Dauch is now a division of West Virginia Pulp & Paper Co.)

In 1903 Morton became the first man to sell a corrugated box for freight shipment. At that time he had been associated with Hinde & Dauch nearly seven years. The buyer was a cereal manufacturer in Buffalo, N. Y.

Dr. Paul D. Merica

Dr. Paul Dyer Merica, president of International Nickel Co. of Canada Ltd. until his retirement in 1954, died recently in a Tarrytown, N. Y. hospital. At the time of his death he was serving as a consul-

tant to the firm on important projects.

Dr. Merica was a director of the company and of its United States subsidiary, International Nickel Co. Inc., as well as of American Metal Co. Ltd., Babcock & Wilcox Co. and Whitehead Metal Products Co. Inc.

He first became associated with International Nickel in 1919, subsequently becoming director of research.

W. E. Byron Baker

W. E. B. Baker

W. E. Byron Baker, 62, director of research for New York & Pennsylvania Co. Inc., died recently while delivering a talk at the firm's Lock Haven, Pa. mill. Baker joined New York & Pennsylvania in 1931 as manager of paper research at Lock Haven. At the time of his death he was in charge of all research activities with offices in New York, N. Y. Prior to his association with the paper manufacturer he was on the staff of Stein, Hall & Co. Inc. and early in his career had been associated with International Paper Co.

Eugene B. Kardon, president of United Container Co. in Philadelphia, died recently.

Arthur K. Hanchett, former president and director of Hanchett Mfg. Co. of Big Rapids, Mich., and Portland, Ore., died recently after a prolonged illness. He became president of the firm in 1927, serving in that capacity until his retirement in 1946.

Charles A. Sommers, secretary-treasurer of Kimberly-Clark Corp. until his retirement in 1937, died recently at his Neenah, Wis. home. He was 76. Sommers joined K-C in 1900, becoming a director in 1931 and secretary-treasurer in 1935.

William J. Trimble, manager of the Robert Gair Div. of Continental Can Co. in Syracuse, N. Y., died recently at the age of 52.

Henry A. Kellnhauser, production superintendent at the Marathon Corp. plant in Wausau, Wis., died in October at the age of 60.

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Logging in rough, rocky terrain or in swamp forests

A system of selective logging in rough terrain by endless monocable, which serves both as carrier and traction cable and is driven by a skid-mounted diesel engine, operates successfully in Switzerland and handles up to 20-25 metric tons of pulpwood per hour.

Travel speed of the endless cable is 5-7 fps, and power is very low, the operation requiring a 16-hp diesel.

Pricing procedure of rosin size changed

Effective January 1, rosin sizes will be quoted on a "flat price" basis by Hercules Powder. Prices will be announced quarterly and will remain constant for 90 days. Previously, rosin size prices fluctuated with the gum rosin market.

The shift away from gum rosin has accelerated with the development in 1956 by Hercules of an improved grade of distilled tall oil rosin and the general acceptance by the mills of paper sizes based on this rosin.

Spray-metallizing of digesters

Green Bay Paper & Pulp Co. reports a successful method for spray-metallizing of digesters. Spray-metallized layers of 0.12-0.25 in. thick can be applied in digesters at a cost of $7.50-$8.00 per sq. ft.

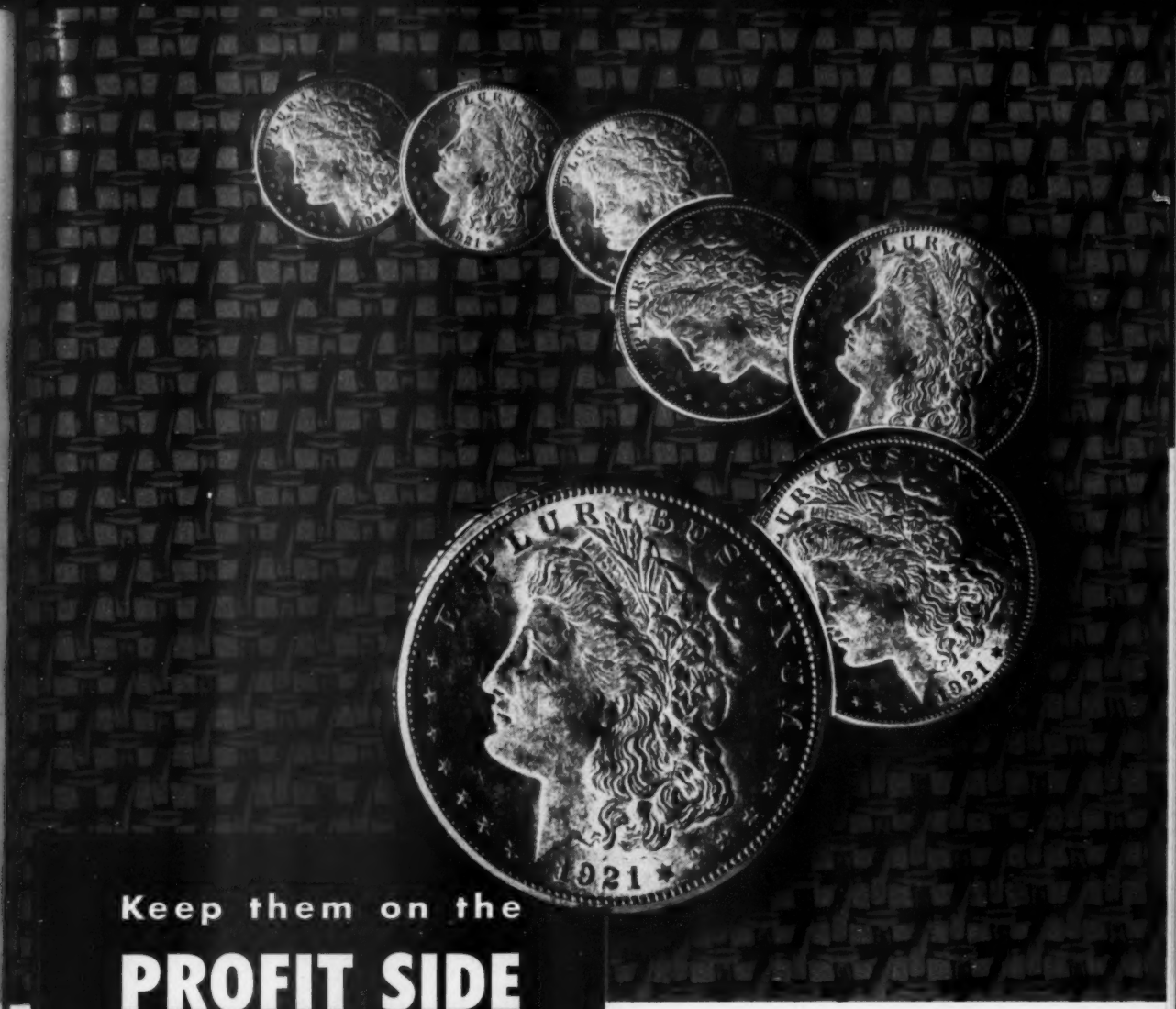
New paper for strong, waterproof, nonstaining package

American Sisalkraft Corp. has developed a new paper laminated with a compounded laminant containing Pliolite latex as the main ingredient and reinforced with a high-tensile fiber.

The paper has high impact strength, mechanical and thermal stability and high resistance to puncture and tear. It is used for packaging of upholstered furniture and other products that require a strong and waterproof packaging material.

Antibiotic saves pine trees from fatal rust disease

An antibiotic has saved thousands of western pine trees from destruction by blister rust. Single applications of the antibiotic Acti-dione (developed by the Upjohn Co.) eradicated fungus growth in over 80 per cent of the treated trees, while more recent information indicates an even greater effectiveness of over 99 per cent.



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PROFIT SIDE

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A significant increase in percentage of filler retained—that's the **DOLLAR-SAVING** experience of more and more mills as a direct result of using a DARLING glue solution as a wet end additive.

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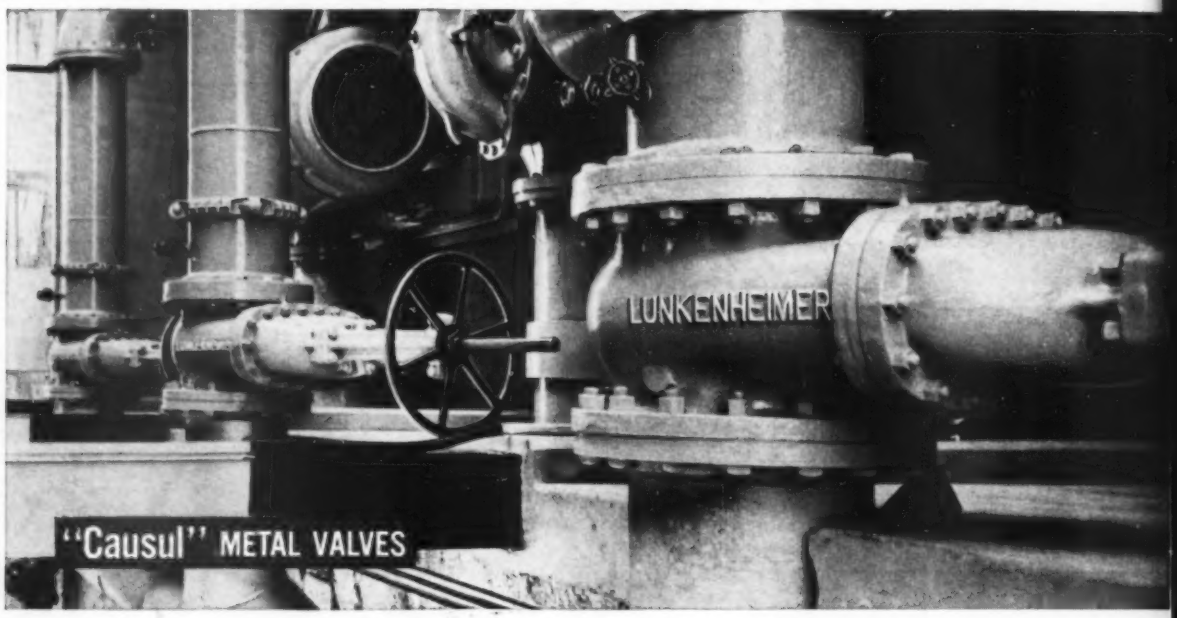

High alloys cost money—big money. They also offer the best corrosion-resistance you can buy. Ordinary iron or bronze, on the other hand, is inexpensive—but it can't hold up in corrosive service.

That means you need *balance:* a body and bonnet with *good* corrosion resistance at a reasonable price, and trim—where the most protection is needed—with *excellent* resistance. And that's the combination you have right here. "Causul" Metal, a Lunkenheimer exclusive, has much more resistance to corrosion than bronze or gray iron. At the same time, it's a lot less expensive than the high alloys. And when you couple these bodies and bonnets with trim in Type 316 Stainless Steel or Monel Metal, you have a real money-saving combination for mildly corrosive service.

Screwed Ends
Fig. 2008-8 (Monel trim)
Fig. 2008-4 (Stainless trim)
½ to 2 inches

Flanged Ends
Fig. 2009-8 (Monel trim)
Fig. 2009-4 (Stainless trim)
1 to 3 inches—clip design
4-6-8 inches—bolted design

Today, the minute a maintenance man touches a wrench to a valve, its cost can double! Find out how you can cut these maintenance costs to rock-bottom with "Causul" Metal Valves.

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